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OIL AND GAS DEVELOPMENTS IN PENNSYLVANIA IN 1988



John A. Harper
Cheryl L. Cozart

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COVER: Photograph of William A. "Uncle Billy" Smith, the man who drilled Drake's well in 1859. "Uncle Billy" was a blacksmith from Butler County, Pennsylvania, who made drilling tools for the brine industry, and who had some experience in drilling salt wells and retrieving tools lost or stuck in the well bores. He not only drilled Drake's well, but he also made the tools and carted them to Titusville. In compensation for his services, he received a wage of \$2.50 per day. Photograph courtesy of the Drake Well Museum, Titusville.

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by John A. Harper and Cheryl L. Cozart
Pennsylvania Geological Survey

PENNSYLVANIA GEOLOGICAL SURVEY

FOURTH SERIES

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1989

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OIL AND GAS DEVELOPMENTS IN PENNSYLVANIA IN 1988

by

John A. Harper and Cheryl L. Cozart

ABSTRACT

Oil production in Pennsylvania totaled 2,807,003 barrels in 1988, a 14.9 percent decrease from 1987 production. Oil reserves also decreased 6 percent, from 45,921,000 barrels in 1987 to 43,114,000 barrels in 1988. Leading counties for production of oil were Elk, Warren, McKean, and Venango. In 1988, secondary recovery of oil in the Bradford field accounted for only 13 percent of the state total.

Gas production increased 2.3 percent, from 163,318 million cubic feet in 1987 to 167,089 million cubic feet in 1988. Gas reserves, however, decreased slightly, from 2,012,673 million cubic feet in 1987 to 1,970,309 million cubic feet in 1988. Stored recoverable gas increased from 585,543 million cubic feet in 1987 to 597,516 million cubic feet in 1988.

The price for Penn Grade crude oil and oil products remained the same during the first quarter of 1988, at \$16.00 per barrel. The price eventually declined to a low of \$14.00 per barrel in September and rose to \$15.00 per barrel by the end of the year. Most new-gas prices were subject to Natural Gas Policy Act price ceilings. The well-head price of one thousand cubic feet of natural gas ranged from a low of \$0.29 under old contracts to \$6.72 for "tight" gas (NGPA Section 107, High-Cost Gas). The average price for gas was about \$2.25.

The total number of wells reported drilled in 1988 was 1,769, a 15 percent decrease from 1987; yet the total footage drilled increased 14 percent, to 6,507,846 feet. Activity during 1988 showed the full impact of the industry slump, having an unprecedented 66 percent one-year decline in reported oil wells. The total number of oil wells reported was 317 as compared with the 1987 figure of 944 oil wells. The most active county for oil well drilling was again Warren, accounting for 64 percent of all oil wells drilled in the state. A total of 1,297 gas wells was reported in 1988 for a 30 percent in-

crease from 1987. The most active counties for gas well drilling were Venango, Erie, Crawford, Indiana, Warren, Armstrong, and Clearfield, accounting for 74 percent of all gas wells drilled in the state. There were 27 combination oil and gas wells reported in 1988, an increase of 200 percent over 1987. Sixteen of these wells were drilled in Warren County.

Development drilling in 1988 decreased 15 percent, to 1,647 wells. Exploratory drilling decreased by 9 percent in the same period, from 76 wells reported in 1987 to 69 wells reported in 1988. At 97 percent, the success rate for development drilling remained at levels comparable with those of 1987. The success rate for exploratory drilling, however, decreased during 1988 to 61 percent due to an increase in unsuccessful new field wildcats.

Seismic exploratory activity increased by 20 percent, from 7.5 crew-months in 1987 to 9 crew-months in 1988. Seismic crews operated in eight counties in Pennsylvania during the year.

Project activity within the Oil and Gas Geology Division of the Pennsylvania Geological Survey in 1988 included continued updating of the oil and gas base map series, and continued work on projects dealing with the geochemistry of petroleum source rocks and the feasibility of producing coal-bed methane.

INTRODUCTION

The year 1988 saw the oil and gas industry in Pennsylvania, and across the nation, continue the downturn started several years earlier. Low-priced foreign oil kept the United States market flooded and domestic crude prices low. The so-called gas glut also continued, keeping prices for natural gas down. This boon to consumers resulted in continued industry sluggishness. Here in Pennsylvania, where drillers filed to drill more than 11,000 wells in 1984, the Bureau of Oil and Gas Management

approved permits on only 1,365 new drilling applications in 1988. Of these, 421 permits were issued for oil wells and 848 were issued for gas wells. Other types of wells accounted for the remainder of the permits issued. This was the smallest number of permits issued since 1971.

Nineteen eighty-eight was the year Quaker State Corporation sold its shallow oil well properties in northwestern Pennsylvania and southwestern New York to General Energy Corporation. Quaker State will remain in the refining and deep gas drilling business. Several smaller companies also sold assets, or entire companies, during 1988. Although most people regard low oil and gas prices as the chief culprits in these "bailouts," at least one industry spokesman cites Pennsylvania's Oil and Gas Law (circa 1984) as the cause. Required bonding or plugging of all wells, plus active enforcement of strict environmental rules, has many industry personnel and representatives upset. Pennsylvania newspapers even carried stories about one outspoken oil man who refused to abide by the new law, claiming that total compliance would put him out of business.

This annual report of oil and gas drilling and production in Pennsylvania is based for the most part on drillers' well records and location plats filed with the Bureau of Oil and Gas Management, Pennsylvania Department of Environmental Resources. The statistics of oil and gas drilling are compiled only from the records received during the calendar year. This includes records of wells drilled prior to, but reported in, 1988; it does not include 1988 wells for which records were submitted to the Commonwealth after December 31, 1988.

ACKNOWLEDGEMENTS

Grateful acknowledgement is extended to the following industry and government organizations, without whose help this report would have been impossible: the American Gas Association; the Appalachian Oil Scouts Association; the Penn Grade Crude Association; the Pennsylvania Economic Development Partnership; the Pennsylvania Department of Environmental Resources, Bureau of Oil and Gas Management, and Bureau of Forestry, Division of Minerals; and the U.S. Department of Energy.

Statewide crude oil production and reserve figures are published courtesy of the Penn Grade Crude Association of Bradford, Pennsylvania. Mary Ann Gross, Equitable Gas Company, supplied statewide data on natural gas production and reserves.

Special thanks go to all of the operators, companies, and personnel of Pennsylvania's oil and gas industry who provided data on producing formations, intervals, drilling costs, oil and gas prices, and other miscellaneous information throughout the year.

The following staff members of the Oil and Gas Geology Division, Pennsylvania Geological Survey, are acknowledged: Christopher D. Laughrey, who assisted with the compilation of the basic well data and the deep-well summary tables; and Lajos J. Balogh, who drafted the figures. The following students are also acknowledged for their diligent work on various phases of the annual report: Rebecca A. Kilbert, University of Pittsburgh; and Gabor L. Toth, Cornell University.

PRODUCTION AND RESERVES

CRUDE OIL PRODUCTION

Pennsylvania's crude oil industry produced 2,807,003 bbl (barrels) of Penn Grade crude oil in 1988, a 15 percent decrease from the 1987 production total of 3,301,763 bbl. Most of this production was from Upper Devonian and Lower Silurian reservoirs, but there was probably some subsidiary production from Pennsylvanian, Mississippian, and Lower Devonian reservoirs. Lower Silurian Medina Group sandstones in Erie and Crawford Counties, and Middle Devonian through Upper Silurian carbonates in Erie and Warren Counties, produced 103,862 bbl of crude oil, a decrease of 23 percent over the previous year. See Figure 1 for a summary of these statistics.

Figure 1. *Crude oil production in Pennsylvania, 1988.*

<i>Penn Grade oil</i> ¹	<i>1988</i>	<i>1987</i>	<i>Percent change</i>	<i>Cumulative to 12/31/88</i>
Shallow oil ²	2,703	3,167	- 15	1,330,903
Deep oil ²	104	135	- 23	1,862
TOTAL OIL	2,807	3,302	- 15	1,332,765

¹In 1,000 barrels.

²See text for explanation.

Figure 2 illustrates the amount of oil produced and the total number of producing oil wells in Pennsylvania in 1988, by county. The leading counties

Figure 2. Oil wells and crude oil produced in Pennsylvania in 1988 and 1987, by counties.

County	Crude oil production (barrels)		Number of producing oil wells, 12/31/88	
	1988	1987	Reported	Estimated
Allegheny	57,852	58,052	225	454
Armstrong	11,256	10,169	109	128
Beaver	13,690	19,463	99	108
Bradford	183	174	1	1
Butler	55,814	60,574	549	742
Clarion	22,806	28,564	283	443
Clearfield	829	1,133	18	18
Crawford	89,630	108,193	279	1,280
Elk	689,535	727,478	468	468
Erie	11,184	22,193	140	158
Fayette	17	148	2	2
Forest	104,505	160,392	484	1,174
Greene	26,586	23,265	365	377
Indiana	8,352	5,746	355	403
Jefferson	3,689	3,436	88	129
Lawrence	0	66	0	0
McKean	438,719	422,267	9,542	12,652
Mercer	9,778	12,535	217	400
Potter	13,305	14,401	67	67
Venango	293,027	383,051	1,724	3,044
Warren	645,172	711,818	2,381	3,099
Washington	63,701	72,989	240	464
Westmoreland	23,592	24,228	100	107
Unknown	223,781	¹ 431,428	—	1,500
TOTAL	2,807,003	¹ 3,301,763	17,736	27,218

¹Adjusted figure; corresponds with 1987 total statewide oil production.

for oil production during the year were Elk, Warren, McKean, and Venango, in that order. These four counties were responsible for 73 percent of the total oil produced in Pennsylvania.

DEVELOPED CRUDE OIL RESERVES

Developed crude oil reserves in Pennsylvania totaled 43,114,000 bbl at the end of 1988. This figure represents a 6 percent decrease from the 1987 total of 45,921,000 bbl. The areas having the highest oil reserves in the Commonwealth included the fields of McKean, Elk, and Potter Counties (particularly the Bradford and Kane fields), the "middle district" (Venango, Forest, and Clarion Counties), and Warren County. Economically recoverable reserves declined in all areas, however, due to the general impact of low prices and the impact of the federal

injection-control law on secondary recovery. Figure 3 shows crude oil reserve statistics by shallow and deep reservoirs.

Figure 3. Crude oil reserves in Pennsylvania, 1988.

Reserves ¹	1988	1987	Percent change
Shallow oil ²	42,775	45,478	— 6
Deep oil ²	339	443	— 23
TOTAL OIL	43,114	45,921	— 6

¹In 1,000 barrels.

²See text for explanation.

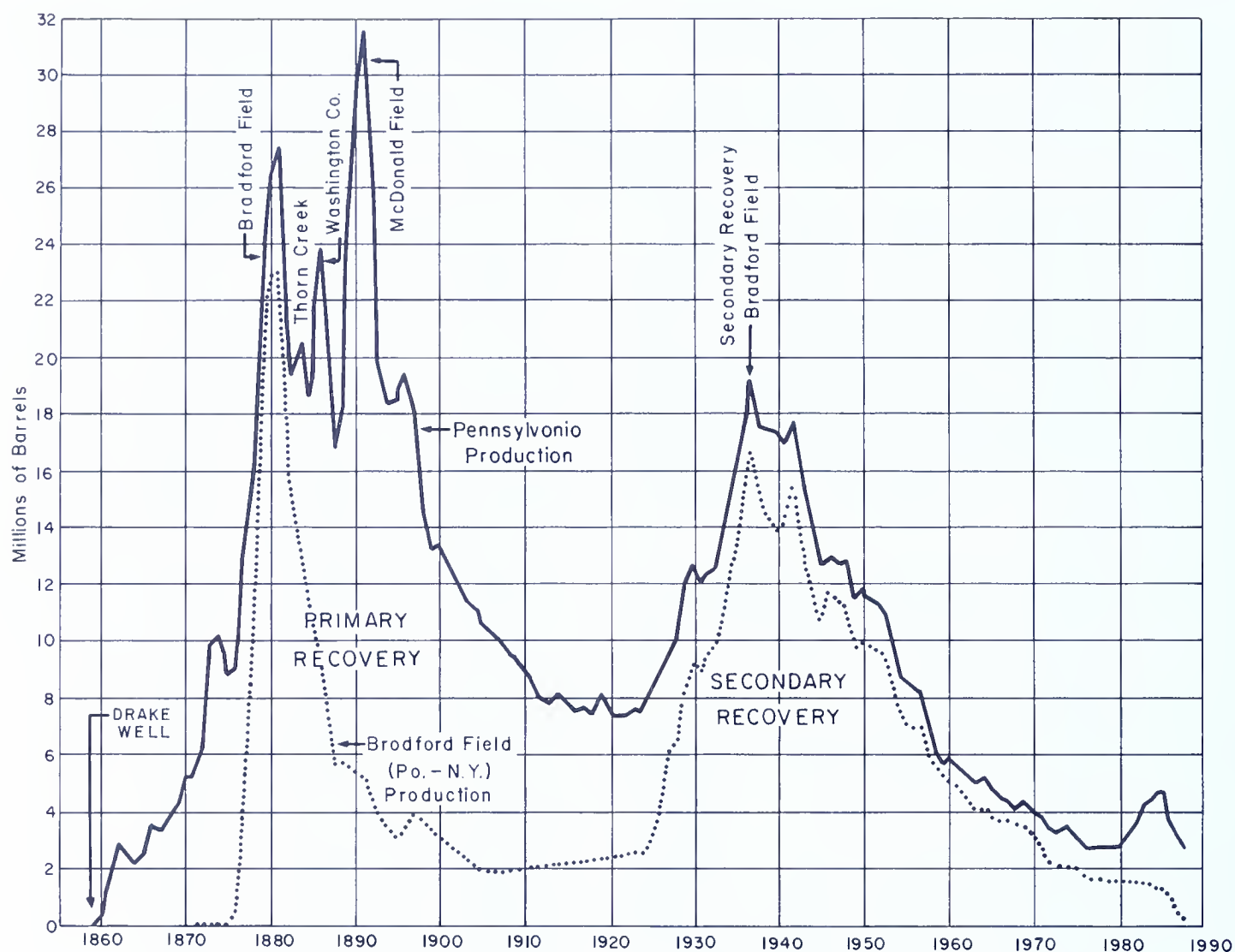


Figure 4. Annual production of crude oil in Pennsylvania, 1859-1988.

ENHANCED OIL RECOVERY

Pennsylvania's oil industry reported 42 new fluid-injection wells and 4 new core test wells in 1988. The core test wells may be used for stratigraphic purposes, for analyzing reservoir rocks for their geologic and engineering characteristics prior to fluid injection, or for analyzing the reservoir during or after fluid injection to see how well the enhanced oil recovery techniques are working. Elk County had the most enhanced oil recovery wells in 1988, including 38 water-injection wells and 3 core test wells. In addition, Washington County reported 1 core test well.

The Bradford field in McKean County is the first field in which large-scale, intentional waterflooding was attempted. Flooding probably began by accident sometime in the late 1800's, and intentional

flooding began soon after. It was not until the early 1900's, however, that noticeable production enhancement became apparent. Since that time, most of the Bradford field has been under waterflood. Figure 4 shows the changes in oil production in Pennsylvania since Drake's well was drilled in 1859, and the changes in oil production in the Bradford field. It should be noted that in 1988 the Bradford field produced only 13 percent of the total state production.

There are presently no tertiary oil recovery projects in operation in Pennsylvania.

NATURAL GAS PRODUCTION

Pennsylvania's natural gas production increased in 1988 by 2 percent, from the 1987 total of 163,318

Mmcf (million cubic feet) to 167,089 Mmcf, a new all-time high. The number of producing gas wells increased 1 percent to an estimated 29,000. Figure 5 shows 1988 gas production statistics for Pennsylvania. Included is a general breakdown of gas production by shallow and deep reservoirs.

Figure 5. Natural gas production in Pennsylvania, 1988.

	¹ 1988	¹ 1987	Percent change	Cumulative to 12/31/88 ¹
Shallow gas ²	130,322	122,944	+ 6	—
Deep gas ³	36,767	40,374	- 9	—
TOTAL GAS	167,089	163,318	+ 2	10,560,477

¹In millions of cubic feet.

²Shallow gas: from Late Devonian or younger rocks, generally less than 4,000 feet deep.

³Deep gas: from Middle Devonian or older rocks, generally more than 4,000 feet deep.

NATURAL GAS RESERVES

Proven recoverable reserves of natural gas in Pennsylvania decreased 2 percent to 1,970,309 Mmcf in 1988. Figure 6 shows natural gas reserve figures for Pennsylvania in 1988, and Figure 7 graphically illustrates the differences among production, consumption, and reserves of natural gas since 1946.

Figure 6. Natural gas reserves in Pennsylvania, 1988.

	¹ 1988	¹ 1987	Percent change
Total gas	1,970,309	2,012,673	- 2
Stored recoverable gas	597,516	585,543	+ 2

¹In millions of cubic feet.

NATURAL GAS STORAGE AREAS

Because Pennsylvania has traditionally consumed more natural gas than it has been able to produce, the natural gas industry stores gas in large quantities in the summer months to at least partially ensure an adequate supply during the winter. Storage

reservoirs are typically old depleted gas-producing reservoirs, or bodies of rock whose geological and engineering characteristics would have made them ideal reservoirs had natural gas been emplaced in them. In Pennsylvania all of the major gas-producing horizons have been used at one time or another as storage reservoirs, but the most common reservoirs are Upper Devonian Bradford and Venango Group sandstones and fractured reservoirs in the Ridgeley Sandstone. Figure 8 shows the locations and names of all active gas storage areas in Pennsylvania in 1988. One storage area, the Schmidt Storage pool in the Saltsburg field, Indiana County, was abandoned in 1988. There were 2 wells reported in 1988 for gas storage, and there were 2 gas-storage observation wells. Recoverable gas in storage totaled 597,516 Mmcf in 1988 as compared with 585,543 Mmcf in 1987. This represents a small increase (2 percent) over last year.

OIL AND GAS PRICES

The price for crude oil in Pennsylvania remained the same during the first quarter of 1988, at \$16.00 per barrel. It peaked from April 18 through May 4 at \$16.50 per barrel, and bottomed at \$14.00 per barrel from September 9 through December 30. On December 31 the price rose to \$15.00. Changes in crude oil pricing in 1988 are shown in Figure 9.

Natural gas prices have been subject to controls under the Natural Gas Policy Act (NGPA) since 1978. The pricing structure of the NGPA raised natural gas prices gradually since then in order to provide operators with more realistic product prices. The lowest prices paid by utilities in Pennsylvania were for old gas, subject to old contracts, produced from pre-NGPA wells. Prices as low as \$0.29 per thousand cubic feet (Mcf) are common for gas bought under old contracts in some of the older producing areas of the Commonwealth. Some NGPA-pricing categories were deregulated on January 1, 1986. The highest price allowed for NGPA-regulated gas was \$6.716 per Mcf for Section 107 (High-Cost Gas, in this case the price allowed for gas from "tight formations" such as the Lower Silurian Medina Group and certain Upper Devonian sandstones). Because of the nationwide gas "glut," however, the highest price paid was \$5.416 per Mcf. The average price for gas was approximately \$2.25 per Mcf. Figure 10 shows NGPA price ceilings for natural gas during 1988.

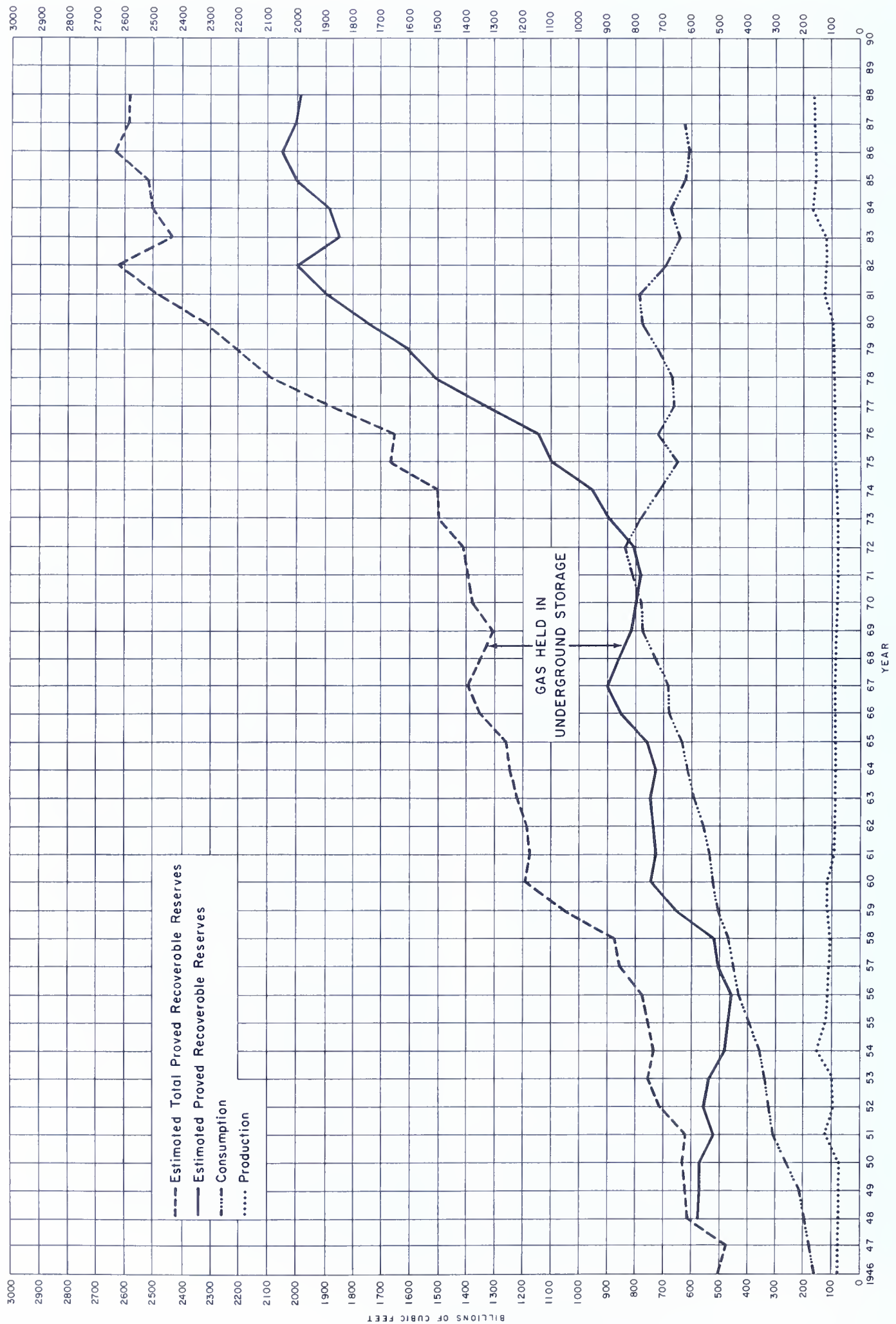


Figure 7. Production, consumption, and reserves of natural gas in Pennsylvania (consumption data are reported one year in arrears).

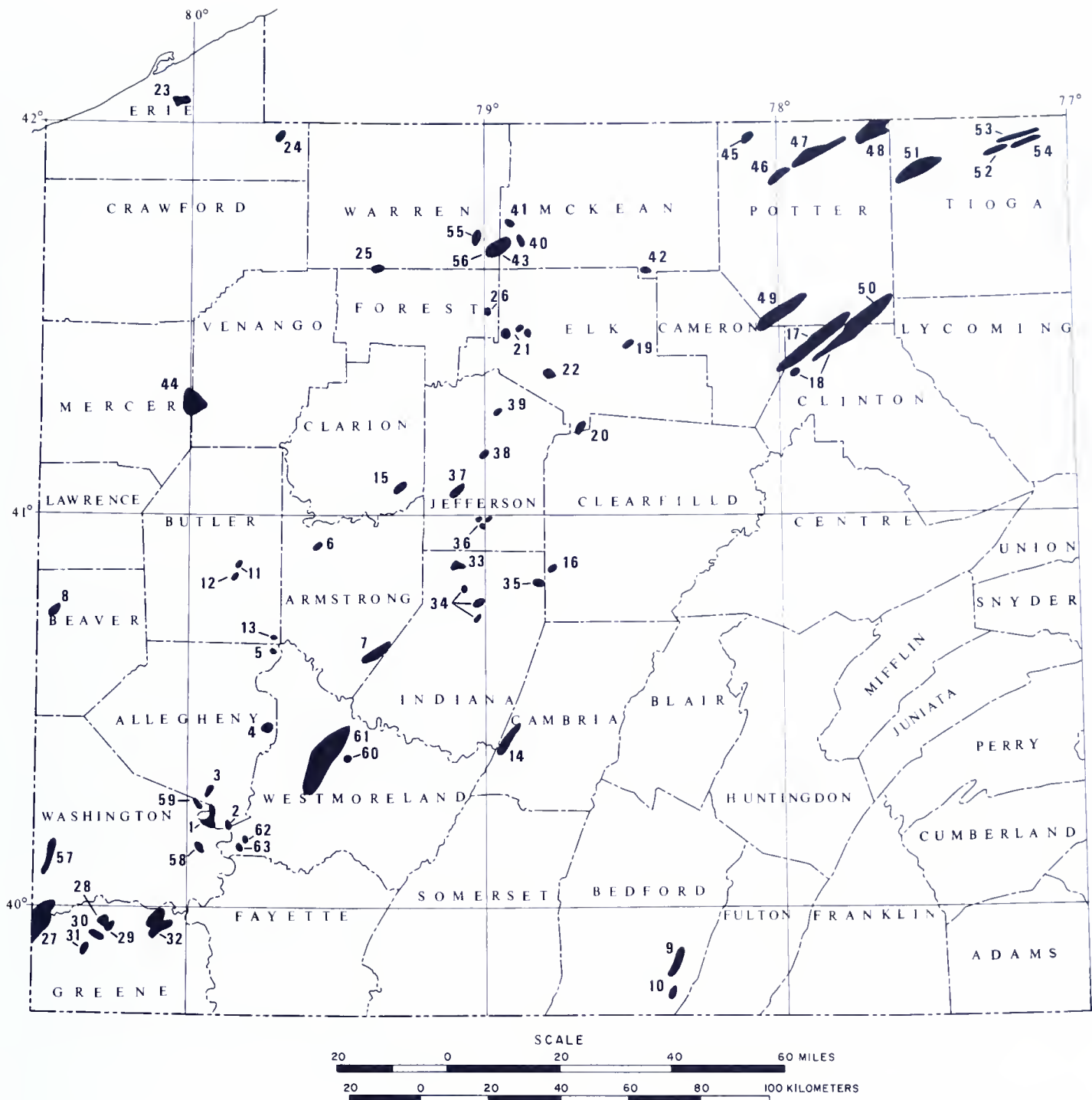


Figure 8. Active natural gas storage areas of Pennsylvania.

NAMES OF ACTIVE GAS STORAGE AREAS IN PENNSYLVANIA

ALLEGHENY COUNTY	BEAVER COUNTY	CAMBRIA COUNTY	ELK COUNTY
1. Bunola	8. Black Hawk	14. Rager Mountain	19. St. Marys
2. Gamble-Hayden		CLARION COUNTY	20. Boone Mountain
3. Tepe	BEDFORD COUNTY	15. Truittsburg	21. Owls Nest
4. Murrys ville (Dice)	9. Artemas A	CLEARFIELD COUNTY	22. Belmouth
5. Smith-Parke	10. Artemas B	16. Gourley-Miller	
	BUTLER COUNTY	CLINTON COUNTY	ERIE COUNTY
ARMSTRONG COUNTY	11. Vardy	17. Leidy	23. Summit
6. Fair and Helm	12. Portman	18. Tamarack	24. Corry
7. South Bend	13. Hughes		

NAMES OF ACTIVE GAS STORAGE AREAS IN PENNSYLVANIA (*Continued*)

FOREST COUNTY	JEFFERSON COUNTY	POTTER COUNTY	WASHINGTON COUNTY
25. Queen	36. Sprankle	(Continued)	57. Donegal
26. Duhring	37. Galbraith	47. Ellisburg	58. Calvin
	38. Markle	48. Harrison	59. Finleyville
GREENE COUNTY	39. Munderf	49. Wharton	WESTMORELAND COUNTY
27. Majorsville-Heard	McKEAN COUNTY	50. Greenlick	60. Seanor
28. Swarts West	40. Keelar	TIOGA COUNTY	61. Oakford
29. Swarts	41. Swede Hill	51. Sabinsville	62. Webster
30. Hunters Cave	42. Wellendarf	52. Palmer	63. Patton
31. Holbrook	43. East Branch "B"	53. Tioga	
32. Pratt	MERCER COUNTY	54. Meeker	
	44. Hendersan	WARREN COUNTY	
INDIANA COUNTY	POTTER COUNTY	55. Deerlick	
33. Alabran	45. Sharon	56. East Branch "A"	
34. Kinter	46. Hebron		
35. Clark			

Figure 9. Crude oil prices in Pennsylvania, 1988.

Date	Price per barrel
January 1, 1988.....	\$16.00
April 18, 1988.....	16.50
May 5, 1988.....	16.00
July 5, 1988.....	15.00
September 9, 1988.....	14.00
December 31, 1988.....	15.00

1988 DRILLING AND COMPLETIONS**TOTAL COMPLETIONS**

Drilling activity as reported by Pennsylvania's oil and gas industry declined during 1988 to 1,769 wells. This was a 15 percent decrease in activity from the 1987 total of 2,085 wells, and represents the smallest number of new wells reported since 1978. The total includes 1,762 new wells and 7 old wells drilled deeper. Of these 1,769 wells reported in 1988, however, only 40 percent were actually drilled in 1988. Pennsylvania's oil and gas industry submitted records on wells drilled and completed as far back as 1976. Figure 11 shows the breakdown of wells reported in 1988 but completed in prior years.

The total footage drilled in all reported wells increased 14 percent, from 5,709,665 feet in 1987 to 6,507,846 feet in 1988. This 14 percent increase in footage, in spite of the 15 percent decrease in drill-

ing, is mainly attributable to a drastic decrease in reported oil wells and a doubling of reported deep wells. Thus, the average total depth in all wells drilled increased to 3,681 feet, over 900 feet more than last year's average of 2,738 feet. The eight most active counties for drilling in 1988 were Warren, Venango, Elk, Erie, Crawford, Indiana, Armstrong, and Clearfield, in that order. Wells in these eight counties accounted for 79 percent of all wells reported in the Commonwealth during the year (see Figure 12).

OIL COMPLETIONS

A drastic downturn in oil well reporting occurred in 1988; only 317 oil wells were reported during the year, representing a 66 percent decrease from the 944 wells reported in 1987. More significantly, of the 317 wells reported, only 21 were actually drilled in 1988. Total reported footage drilled was 439,225 feet, a 62 percent decrease over that of a year ago. The average total depth for all oil wells was 1,397 feet. Warren County was again the most active area for oil well drilling with 203 reported wells, accounting for 64 percent of all oil wells reported in the Commonwealth in 1988 (Figure 13).

GAS COMPLETIONS

Pennsylvania's natural gas industry reported 1,297 gas well completions in 1988, including 7 old wells drilled deeper, a 30 percent increase over the 1987 figure of 996 wells. The total footage drilled in all gas wells was 5,608,977 feet, a 37 percent increase over 1987. The average depth for all new gas

Figure 10. Natural gas price ceilings under federal Natural Gas Policy Act in 1988.

NGPA Section	Category of gas	Maximum lawful price for deliveries made in:											
		Jan. 1988	Feb. 1988	Mar. 1988	Apr. 1988	May 1988	June 1988	July 1988	Aug. 1988	Sept. 1988	Oct. 1988	Nov. 1988	Dec. 1988
cost per million British Thermal Units (dollars)													
102	New, Natural Gas Certain OCS Gas	Deregulated January 1, 1985											
103(a)	New, Onshore Production Wells ¹	Deregulated January 1, 1985											
103(b)(1)	New, Onshore Production Wells ²	3.252	3.260	3.268	3.276	3.283	3.290	3.297	3.309	3.321	3.333	3.345	3.358
107(c)	Gas Produced from Tight Formations	6.504	6.520	6.536	6.552	6.566	6.580	6.594	6.618	6.642	6.666	6.690	6.716
108	Stripper Gas	5.103	5.131	5.160	5.189	5.217	5.245	5.273	5.308	5.343	5.379	5.416	5.453
109	Not Otherwise Covered	2.695	2.701	2.707	2.713	2.719	2.725	2.731	2.741	2.751	2.761	2.771	2.781

¹Wells deeper than 5,000 feet.²Prices only apply to Interstate. All previous 103 categories are now deregulated.

Figure 11. Number of well records received in 1988 by completion date.

Completion date	No. of wells
1976	7
1977	9
1978	5
1979	5
1980	11
1981	31
1982	31
1983	56
1984	107
1985	67
1986	47
1987	692
1988	701
TOTAL	1,769

wells also increased to 4,331 feet. The most active counties for gas well drilling were Venango, Erie, Crawford, Indiana, Warren, Armstrong, and Clearfield, accounting for 75 percent of all gas wells reported during the year. These data are summarized in Figure 14.

COMBINATION OIL AND GAS WELL COMPLETIONS

(Not Reported Separately as Oil or Gas)

The Pennsylvania Geological Survey classifies a combination oil and gas well as any well that produces oil as a primary energy-mineral commodity, but that also produces at least 50 Mcfgpd (thousand cubic feet of gas per day). Most oil wells drilled in Pennsylvania produce a little gas, and many produce enough gas to be sold to utilities or pipeline companies. However, if the well produces less than 50 Mcfgpd, regardless of whether or not the gas is sold, it is considered an oil well.

Pennsylvania's oil and gas operators reported 27 combination wells in 1988, a 200 percent increase over the 1987 total of 9 combination wells. Total footage for these 27 wells was 54,561 feet, and the average depth was 2,021 feet. These data are summarized in Figure 15.

DRY COMPLETIONS

A total of 75 dry holes was reported in Pennsylvania in 1988. These wells represent a 17 percent

Figure 12. New well completions and old wells drilled deeper in Pennsylvania, 1988.

NEW WELL COMPLETIONS		
County	No. of wells	Average total depth (feet)
Allegheny	3	2,546
Armstrong	122	3,475
Beaver	5	1,478
Butler	12	2,407
Cambria	4	4,001
Cameron	1	6,060
Centre	44	4,732
Clarion	19	2,536
Clearfield	112	4,287
Clinton	16	4,470
Crawford	155	4,879
Elk	172	2,510
Erie	163	3,748
Fayette	14	4,195
Forest	15	1,079
Greene	3	3,994
Indiana	143	3,784
Jefferson	43	3,530
Juniata	1	5,288
Lawrence	1	780
Lycoming	2	2,120
McKean	30	2,293
Mercer	53	5,288
Montgomery	1	5,764
Potter	12	2,021
Somerset	7	8,251
Sullivan	2	8,931
Tioga	2	4,188
Venango	181	4,946
Warren	357	2,711
Washington	1	2,477
Westmoreland	66	4,097
TOTAL	1,762	3,681
OLD WELLS DRILLED DEEPER		
County	No. of wells	Average amount deepened (feet)
Armstrong	1	91
Butler	1	1,115
Erie	3	1,008
Indiana	1	208
Westmoreland	1	18
TOTAL	7	637

increase in the number of dry holes from 1987, when 64 dry holes were reported. The overall success rate remains about the same at 96 percent. The total footage for dry holes in Pennsylvania in 1988 was 271,818 feet, a 6 percent decrease over 1987.

Figure 13. New oil well completions in Pennsylvania, 1988.

County	No. of wells	Average initial production (bopd) ¹	Average total depth (feet)
Beaver	4	5.75	1,504
Butler	6	3.38	1,510
Clarion	1	.14	1,340
Crawford	1	0	439
Elk	56	0	2,471
Forest	12	15.50	960
McKean	7	9.04	1,780
Mercer	1	0	1,158
Potter	2	4.25	1,421
Venango	24	3.33	882
Warren	203	6.42	1,175
TOTAL	317	5.31	1,397

¹bopd, barrels of oil per day.

The average total depth for dry holes was 3,624 feet (Figure 16).

MISCELLANEOUS WELLS

Miscellaneous wells include all wells that cannot specifically be considered oil- and gas-producing wells or dry holes. They include service wells and junked and abandoned wells. Service wells comprise several types: stratigraphic core tests, drilled to collect subsurface information such as formation thickness or the effects of well completion on various rock types; water-supply wells for waterflood projects; fluid-injection wells for secondary and tertiary recovery of oil; liquid-waste disposal wells; and gas storage wells. Increases and decreases within this category do not accurately reflect oil and gas drilling trends because, for instance, an oil field operator may drill all of his water-supply wells and fluid-injection wells several years after the oil-producing wells have been completed.

In 1988 the oil and gas industry reported 53 miscellaneous wells in Pennsylvania. This is a 26 percent decrease from the 1987 total of 72 wells. Of the 53 miscellaneous wells, 50 were classified as service wells. Forty-two of the service wells reported were water-intake wells for secondary oil recovery projects, 4 were stratigraphic core tests, 2 were gas storage wells, and 2 were gas-storage observation wells. The total footage drilled in these 50 service wells was 118,795 feet. Additionally, under the miscellaneous classification, 3 junked holes were drilled totaling 10,785 feet. The average total depth for all

Figure 14. New gas well completions and old gas wells drilled deeper in Pennsylvania, 1988.

NEW GAS WELL COMPLETIONS			
County	No. of wells	Average initial open flow (Mcf/gpd) ¹	Average total depth (feet)
Allegheny	1	312	3,522
Armstrong	121	386	3,480
Butler	5	12	2,574
Cambria	3	425	4,110
Centre	38	998	4,800
Clarion	17	41	2,688
Clearfield	110	831	4,259
Clinton	11	1,386	4,360
Crawford	151	988	4,947
Elk	58	346	2,564
Erie	155	1,244	3,774
Fayette	12	590	4,292
Forest	3	226	1,556
Greene	2	213	3,957
Indiana	139	828	3,783
Jefferson	41	439	3,564
Lawrence	1	0	780
McKean	15	403	2,618
Mercer	46	1,041	5,423
Potter	4	229	2,412
Somerset	7	2,838	8,251
Venango	157	644	5,567
Warren	131	1,107	5,295
Westmoreland	62	819	4,060
TOTAL	1,290	829	4,331

OLD GAS WELLS DRILLED DEEPER

County	No. of wells	Average initial open flow (Mcf/gpd) ¹	Average amount deepened (feet)
Armstrong	1	200	91
Butler	1	10	1,115
Erie	3	512	1,008
Indiana	1	280	208
Westmoreland	1	118	18
TOTAL	7	306	637

¹Mcf/gpd, thousand cubic feet of gas per day.

service wells was 2,334 feet. The average total depth for all miscellaneous wells was 2,445 feet (Figure 17).

DRILLING AND COMPLETION COSTS

The costs of drilling and completing a well, given below in dollars per foot, vary with the company, drilling depth, method of completion, and geo-

Figure 15. *New combination oil and gas well completions in Pennsylvania, 1988.*

County	No. of wells	Average initial production (bopd) ¹	Average initial open flow (Mcf/gpd) ²	Average total depth (feet)
Clarion	1	1.00	15	1,145
Crawford	1	³	30	3,744
Elk	1	2.00	259	1,971
Erie	1	100.00	1,000	2,771
Greene	1	3.00	250	4,069
McKean	5	.05	43	2,051
Mercer	1	1.00	100	5,394
Warren	16	7.13	29	1,576
TOTAL	27	8.19	86	2,021

¹bopd, barrels of oil per day.²Mcf/gpd, thousand cubic feet of gas per day.³Initial production not reported.

graphic area. Costs generally increase yearly due to inflation, but they may decline if the prices for fossil fuels (needed in manufacturing and transporting casing, cement, etc.) decline. Prices typically increase as total depth increases, especially for wells that penetrate deeper, undrilled or untested formations. Dry holes are generally less expensive than producing wells because not much is done to the hole outside of drilling and, perhaps, logging. Extremely deep wells may be extraordinarily expensive, not just because of increased rig time and increased casing, cementing, and other needs, but because provisions must be made for potential unforeseen problems. Wells drilled in untested formations and/or unexplored areas may require special testing and completion techniques as well. In Pennsylvania an average well would be drilled about 3,681 feet deep (the average total depth for all wells reported in 1988), probably to the Upper Devonian Venango Group, Bradford Group, or Lock Haven Formation. As such, a deep well (Lower Devonian Ridgeley Sandstone or Lower Silurian Medina Group) is generally greater than 5,000 feet deep, and a well deeper than 10,000 feet is considered ultra deep.

Because drilling conditions and company policies vary widely, even within a small geographic area, the drilling costs listed below are only estimates and should not be used as anything more than "ball-park" figures for the industry in 1988.

1. Venango County, shallow oil well in the Venango Group sandstones, about 800 feet deep. Dry hole,* about \$15 per foot. Completion, about \$25 per foot.
2. McKean-Elk County area, shallow oil well in the Bradford Group sandstones, about 2,400

Figure 16. *New dry hole completions in Pennsylvania, 1988.*

County	No. of dry holes	Average total depth (feet)
Allegheny	2	2,058
Armstrong	1	2,875
Beaver	1	1,373
Butler	1	6,954
Cambria	1	3,673
Cameron	1	6,060
Centre	6	4,302
Clearfield	2	5,853
Clinton	5	4,713
Crawford	2	2,575
Elk	16	2,543
Erie	6	3,857
Fayette	2	3,614
Indiana	4	3,815
Jefferson	2	2,847
Juniata	1	5,288
Lycoming	2	2,120
McKean	3	2,267
Mercer	4	4,728
Montgomery	1	5,764
Potter	4	2,184
Sullivan	2	8,931
Warren	2	1,111
Westmoreland	4	4,675
TOTAL	75	3,624

Figure 17. *New miscellaneous well completions in Pennsylvania, 1988.¹*

County	No. of wells	Average total depth (feet)
Elk	41	2,486
Erie	1	117
Mercer	1	5,350
Potter	2	1,511
Tioga	2	4,188
Warren	5	1,661
Washington	1	2,477
TOTAL	53	2,445

¹Miscellaneous well completions include gas injection, water intake, stratigraphic core tests, gas storage wells, gas-storage observation wells, and junked holes.

feet deep. Dry hole,* about \$9.00 per foot. Completion, about \$16.00 per foot.

3. Elk County, shallow injection well in the Kane sand, about 2,400 feet deep. Completion, about \$19 per foot.

4. Indiana-Cambria-Clearfield County area, shallow gas well in the Bradford Group sandstones, about 3,600 feet deep. Dry hole,* about \$22 per foot. Completion, about \$32 per foot.
5. Fayette-Westmoreland County area, shallow gas well in the Bradford Group sandstones, about 4,000 feet deep. Dry hole,* about \$23 per foot. Completion, about \$39 per foot.
6. Crawford-Venango-Warren County area, deep gas well in the Medina Group sandstones, about 5,500 feet deep. Dry hole,* about \$22 per foot. Completion, about \$32 per foot.
7. Westmoreland-Somerset County area, deep gas well in the Ridgeley Sandstone, about 7,500 feet deep. Dry hole,* about \$45 per foot. Completion, about \$75 per foot.
8. North-central Pennsylvania area, ultra-deep well about 17,000 to 19,000 feet deep. Dry hole,* \$265 per foot. Completion, about \$410 per foot.

*No completion attempted.

DEEP AND SHALLOW ACTIVITY

The Oil and Gas Geology Division of the Pennsylvania Geological Survey classifies oil and gas wells as shallow or deep depending on the stratigraphic level penetrated, rather than on actual depth. In general, wells that penetrate the top of the Tully Limestone or its equivalent (the presently accepted Upper-Middle Devonian boundary) are considered deep. Wells that do not penetrate the Tully horizon are generally considered shallow. The exceptions to this general rule involve formations of great significance, such as the rocks of the Mesozoic basins in southeastern Pennsylvania. Because the Appalachian basin is wedge shaped, absolute drilling depth is not instrumental in this classification. As such, a Lower Silurian Medina Group well along the shore of Lake Erie in Erie County may be only 2,500 feet deep, whereas an Upper Devonian Lock Haven Formation well in Centre County may be greater than 5,000 feet deep. Yet, the Medina well is considered deep and the Lock Haven well is considered shallow on the basis of stratigraphic interval penetrated.

Shallow wells account for the greatest number of wells drilled in Pennsylvania; they may produce oil, gas, or both. Deep wells are rarer than shallow wells because of increased cost and risk; they most commonly produce gas, but there are numerous deep wells in northwestern Pennsylvania that also pro-

duce oil. Very few deep wells produce oil as their main, or sole, energy-mineral commodity. Figure 18 illustrates shallow-well drilling activity since 1950, and Figure 19 shows the changes in deep-well drilling activity during the period 1950–88.

There were 1,095 shallow wells reported in Pennsylvania in 1988, a decrease of 35 percent from the 1,694 wells reported in 1987. This 1988 total includes 1,042 new oil, gas, combination, and dry wells, 4 old wells deepened, and 49 miscellaneous wells. In general, both the shallow oil wells and the shallow gas wells were drilled to Upper Devonian Venango and Bradford Group reservoirs. Subsidiary drilling in other shallow horizons found production in the (1) Pennsylvanian Pittsburgh and Sewickley coals; (2) Lower Mississippian “Murrysville” sand; and (3) Upper Devonian Elk Group, Lock Haven Formation, Brallier Formation, Scherr Formation, and Ohio Shale. Shallow oil- and/or gas-well drilling in Warren, Elk, Indiana, Venango, Armstrong, and Clearfield Counties accounted for 52 percent of all shallow drilling reported in 1988.

Reported deep drilling in Pennsylvania increased markedly in 1988. During the year 674 deep wells were reported, an increase of 72 percent over the 1987 figure of 391 deep wells. The most active areas for deep drilling in Pennsylvania continued to be the northwestern counties of Erie, Venango, Crawford, Warren, and Mercer, accounting for 96 percent of all deep-well activity. Other deep formations drilled during 1988 for natural gas (and oil) production include the (1) Middle Devonian Tully Limestone, Onondaga Formation, and Huntersville Chert; (2) Lower Devonian Bois Blanc and Oriskany Formations, and Ridgeley Sandstone; (3) Upper Silurian Bass Islands Dolomite and Salina Group; and (4) Middle Silurian Lockport Dolomite.

Figure 20 shows the statistical breakdown for both shallow and deep wells reported in Pennsylvania in 1988. Figure 21 illustrates shallow- and deep-well drilling in terms of the final reported producing formations.

Shallow production totaled 130,322 Mmcf of gas and 2,703,141 bbl of oil, whereas deep production accounted for 36,767 Mmcf of gas and 103,862 bbl of oil. Figure 22 shows deep gas production during the year by field and pool. In Figure 23, the information in Figure 22 is summarized by showing amounts of gas produced from the various deep reservoirs, both as an annual total and as a cumulative total. Figure 24 illustrates the amount of production, the yearly average unit price, and yearly total values for oil and gas produced in Pennsylvania since 1960.

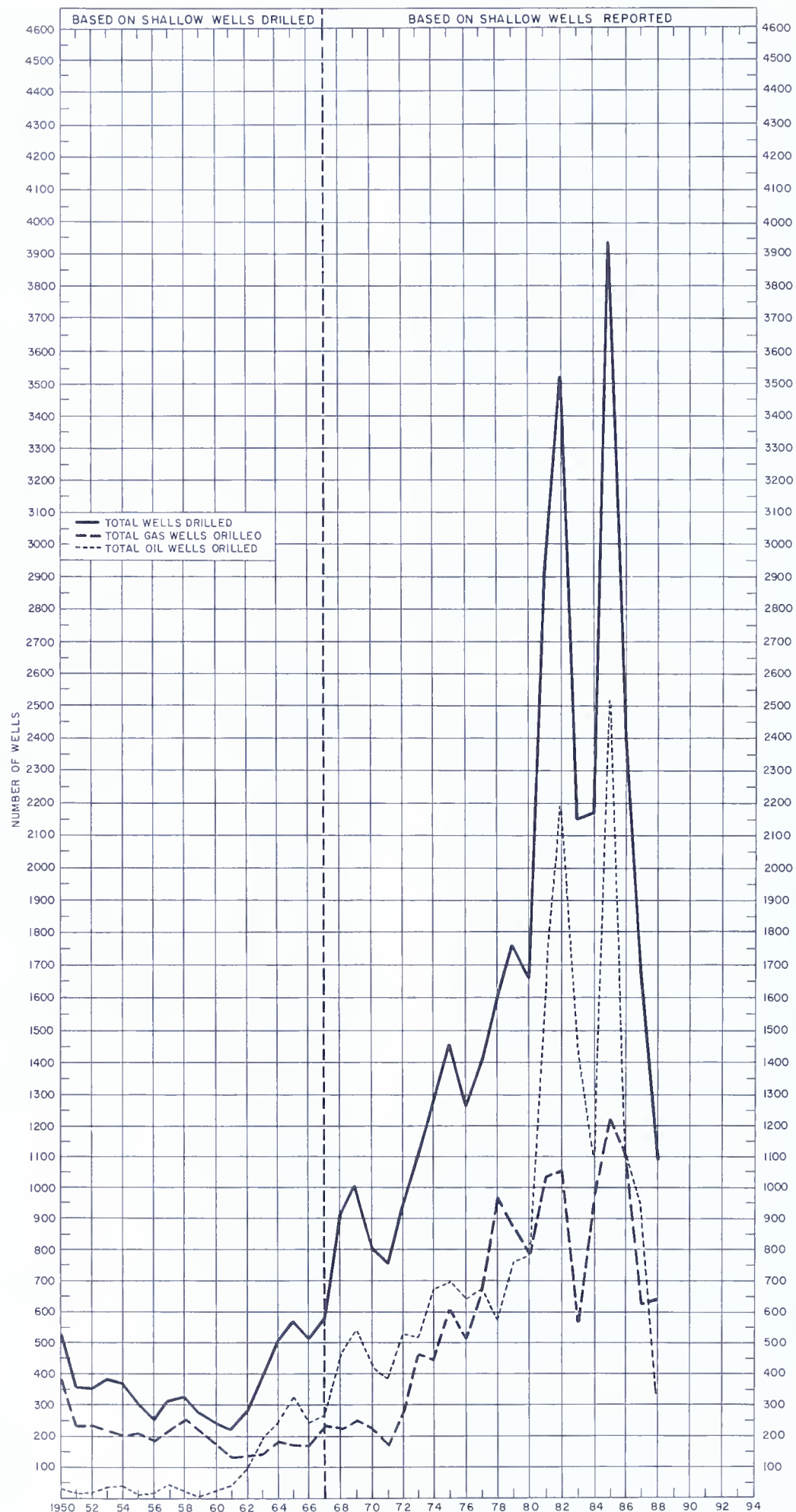


Figure 18. Shallow-well activity, 1950-88 (Late Devonian or younger producing horizons, generally less than 4,000 feet deep).

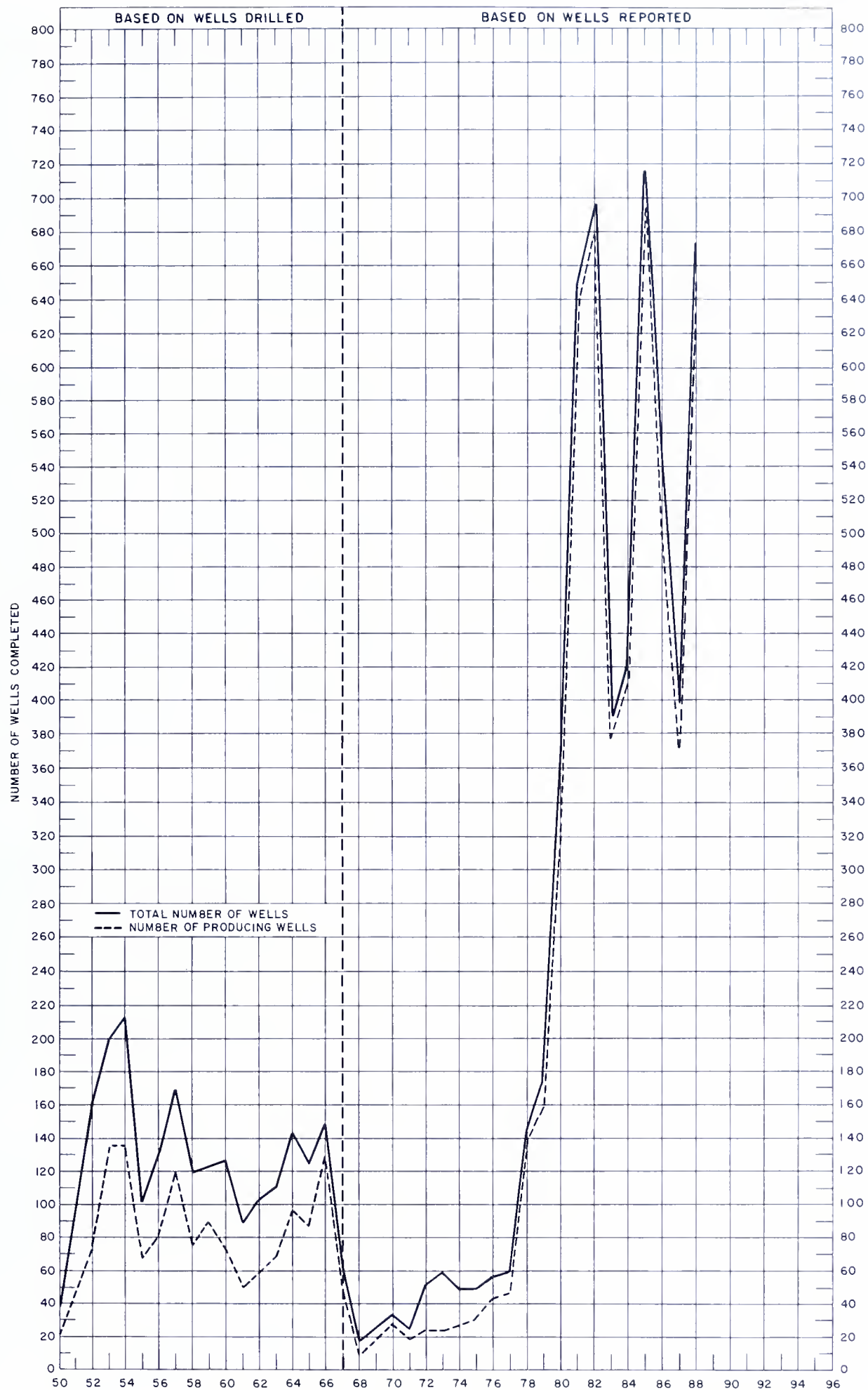


Figure 19. Annual rate of deep formation exploration and development, 1950-88 (Middle Devonian or older producing horizons, generally more than 4,000 feet deep).

Figure 20. *Drilling and completion of wells reported, 1988 (according to geologic age and depth of producing horizons).*

<i>Shallow—Upper Devonian and younger</i>	
NEW WELLS	
Gas	645
Oil	316
Oil and gas	24
Dry	57
Total new wells	1,042
DEEPENED WELLS	
Gas	4
MISCELLANEOUS WELLS	
Stratigraphic core tests	4
Gas storage observation	2
Junked holes	1
Water injection	42
Total miscellaneous wells	49
Total shallow wells	1,095
<i>Deep—Middle Devonian and older</i>	
NEW WELLS	
Gas	645
Oil	1
Oil and gas	3
Dry	18
Total new wells	667
DEEPENED WELLS	
Gas	3
MISCELLANEOUS WELLS	
Gas storage	2
Junked holes	2
Total miscellaneous wells	4
Total deep wells	674
TOTAL ALL WELLS DRILLED	1,769

PENNSYLVANIA DRILLING AND PRODUCTION RECORDS

The drilling depth record for Pennsylvania was set at 21,460 feet by the Amoco Production Company #1 Svetz well in Somerset County in 1974. The well penetrated the top of the Middle Cambrian. This is also the deepest well drilled in the Appalachian basin. The deepest producing depth in Pennsylvania is 13,168 feet in the Texaco U.S.A. #1 Commonwealth of Pennsylvania Tract 289 well, which was completed in Lycoming County in 1985. Production in this well is from the Upper Ordovician Bald Eagle Formation. The record for largest initial production of gas for both Pennsylvania and

the Appalachian basin is held by the New York State Natural Gas #1 Finnefrock well in the Leidy field, Clinton County. The well flowed 145,000 Mcfgpd without stimulation from the Lower Devonian Ridgeley Sandstone at 6,339 feet when drilled in 1951. The largest initial production for oil in Pennsylvania is, once again, an Appalachian basin record. The Jennings Brothers #1 Mathews well in the McDonald-McCurdy field, Allegheny County, reportedly flowed between 12,000 and 21,000 bopd (barrels of oil per day) from the Upper Devonian Venango Group ("Fifth sand") in 1891.

OIL AND GAS EXPLORATORY AND DEVELOPMENT ACTIVITIES

The Pennsylvania Geological Survey, Oil and Gas Geology Division, uses a classification scheme for exploratory and development drilling that is modified from the definitions used by the Committee on Statistics of Drilling of the American Association of Petroleum Geologists. All wells reported here are the same as those reported under drilling and completions in the previous section of this report. In Figure 25, drilling activity in Pennsylvania in 1988 is summarized as exploratory, development, or service.

EXPLORATORY WELLS

An exploratory well is one that is drilled to (1) find and produce oil or gas in unproven areas; (2) find a new reservoir in an area previously known to have oil and/or gas production in another reservoir; or (3) extend the known limit of a productive oil or gas reservoir. New field wildcats, new pool wildcats, deeper pool tests, shallower pool tests, and outpost/extension tests make up the exploratory categories. If the well is drilled as an exploratory test and is not completed for production, it is classified as a dry exploratory hole.

Exploratory drilling in Pennsylvania accounted for 69 of the new well completions reported in Figure 25. Of these, 42 were productive, for a success rate of 61 percent. This is a decrease from the previous year, when 74 percent of 76 exploratory wells were successfully completed. It should be pointed out that "success" means simply that the well was completed for production without specific reference to long-term economic viability. Figure 26 shows the breakdown of exploratory drilling by classification. All exploratory successes and the

Figure 21. Oil and gas well completions in Pennsylvania by shallow and deep producing formations, 1988.

		<i>Oil wells</i>	<i>Gas wells</i>	<i>Combination oil and gas wells</i>	<i>Gas storage wells</i>	<i>Total wells</i>
<i>Producing formation</i>						
S H A L L O W	Pennsylvanian/Mississippian	0	1	0	0	1
	Mississippian	0	5	0	0	5
	Mississippian/Venango	0	1	0	0	1
	Mississippian/Venango/Bradford	0	3	0	0	3
	Mississippian/Bradford	0	4	0	0	4
	Venango	94	9	1	0	104
	Venango/Bradford	0	110	0	0	110
	Venango/Bradford/Elk	0	11	0	0	11
	Bradford	222	¹ 348	22	0	592
	Bradford/Elk	0	68	0	0	68
	Elk	0	29	0	0	29
	Catskill/Lock Haven	0	7	0	0	7
	Lock Haven	0	44	0	0	44
	Scherr	0	1	0	0	1
	Brallier	0	1	1	0	2
	Ohio Shale	0	8	0	0	8
	Subtotal	316	650	24	0	990
D E E P	Tully	0	1	0	0	1
	Onondaga/Bois Blanc	1	1	1	0	3
	Huntersville/Ridgeley	0	13	0	0	13
	Oriskany	0	3	0	0	3
	Ridgeley	0	3	0	2	5
	Bass Islands	0	1	0	0	1
	Lockport	0	1	0	0	1
	Medina	0	624	2	0	626
	Subtotal	1	647	3	2	653
GRAND TOTAL		317	1,297	27	2	1,643

¹One deep well producing shallow.

more important exploratory failures of 1988 are illustrated in Figure 27, and these wells are listed in Figures 28 and 29.

DEVELOPMENT WELLS

A development well is one that is drilled within a proven area of production to a known productive stratigraphic horizon. A producing well in such an area and reservoir is classified as an oil or gas development well. It is considered a dry development well if it is not completed for production.

Development drilling in Pennsylvania declined 15 percent from 1987; only 1,647 wells were drilled in 1988. The success rate for all development drilling remained high at 97 percent.

HIGHLIGHTS OF 1988 EXPLORATION AND DEVELOPMENT

As in previous years, shallow drilling dominated oil and gas activity in Pennsylvania in 1988, accounting for more than 60 percent of all wells reported. Shallow targets in Pennsylvania classically include a few Mississippian sandstone reservoirs supporting the more numerous and more prolific Upper Devonian sandstone reservoirs of the Venango, Bradford, and Elk Groups and the Lock Haven Formation. In 1988, one operator even produced gas from the Pennsylvanian Monongahela Group (Sewickley and Pittsburgh coal beds) in Greene County. In addition, several deeper Upper Devonian reservoirs, such as the Catskill and Brallier Formations, currently act as subsidiary reservoirs.

Figure 22. Gas production from rocks of Middle Devonian or older age in Pennsylvania, 1988 (classified as "deep" production).

County	Field	Pool	Discovery date	Production 1988 (Mcf) ¹	Cumulative production at end of 1988 (Mcf) ¹	Status of field or pool at end of 1988 ²	Reser-voir ³
Armstrong	Goheenville	Snyderville	10/23/70	4	356,214	Prod.	O
	Roaring Run	Roaring Run	12/14/70	4	7,728,662	Prod. and SI	O
		Oriskany					
Cambria	Carrolltown	Burley	1/13/69	4	373,872	Prod. and SI	O
		Pindleton	6/30/69	4	5,658,521	Prod. and SI	O
Cambria and Indiana	Strongstown	Lizowitz	6/19/54	11,771	13,507,175	Prod. and SI	O
		Pineton	12/20/69	4	14,164,083	Prod. and SI	O
Cameron and Elk	Hicks Run		6/ 7/56	⁵ 7,119	4,397,161	Prod. and SI	O
	Whippoorwill		7/10/61	27,448	16,467,928	Prod. and SI	O
Cameron, Clearfield, Elk, Indiana, and Jefferson	Punxsutawney-	TOTAL	9/15/51	95,335	385,095,012	Prod., SI, and aban.	O
	Driftwood						
		Benezette	1/ 5/53	1,339	252,182,183	Prod., SI, and aban.	O
		Driftwood	9/15/51	24,271			
		Grove Hill	2/18/81	4	11,719	SI	O
		Helvetia	5/11/60	8,180			
		Rockton	2/25/55	58,756	132,901,110	Prod.	O
		Reed-Deemer	12/ 1/53	2,789			
Centre	Big Run		3/31/82	94,964	399,611	Prod.	T
	Black Moshannon		12/18/77	4	2,747,712	Prod. and SI	T
	Devils Elbow		2/28/80	⁵ 7,366	680,762	Prod.	T
Clearfield	Runville		1/13/83	436,225	2,573,192	Prod.	O
Clearfield, Elk, and Jefferson	Gifford Run						
	Penfield		1/ 6/60	22,340	106,383,087	Prod. and SI	O
Clinton and Lycoming	Grugan	DuBois	8/26/63	23,083	1,477,235	Prod. and SI	O
Crawford	Athens	Sabula	8/12/82	476,658	3,567,573	Prod.	BE
		TOTAL	9/20/74	2,198,068	13,755,401	Prod. and SI	M
		Brimstone	1/30/79	663,077	4,860,929	Prod. and SI	M
		Dutch Hill	8/31/80	305,345	2,214,099	Prod.	M
		Lincolnville	8/16/80	54,916	468,605	Prod.	M
		Potash Run	3/18/79	31,566	428,110	Prod.	M
		Rome	6/ 9/79	1,000,563	3,903,018	Prod.	M

Black Ash	Motter	3/ 7/86	17,708	52,478	Prod.	M
Blooming Valley		8/ 5/81	⁴	144,432	Prod.	M
Cambridge Springs		1/31/76	97,653	1,915,287	Prod. and SI	M
Conneaut Lake	Cambridge	4/ 6/76	729	304,578	Prod. and SI	M
Eaton Corners		8/ 9/82	14,035	132,502	Prod. and SI	M
Fauncetown	Brown Hill	11/15/81	⁴	689,958	Prod.	M
Frenchtown	Crawther	9/16/86	184,203	237,693	Prod. and SI	M
Geneva		8/17/80	11,004	86,551	Prod.	M
	Greenwood	10/31/73	57,607	469,286	Prod.	M
	Rock Creek	6/27/77	60,775	802,122	Prod.	M
Papenfuse		11/16/80	20,995	282,790	Prod. and SI	M
Randolph	Delamater	9/11/81	⁴	18,090	Prod. and SI	M
Richmond	Woodcock	7/21/81	1,021	60,677	Prod.	M
Township						
Rockdale	Zirkle	6/22/81	⁴	73,115	Prod. and SI	M
Sparta		11/30/79	⁴	4,247,062	Prod., SI, and aban.	M
Conneaut	Eastman Hill	10/30/75	40,794	91,784	Prod., SI, and aban.	M
Crawford and Erie.....	<i>TOTAL</i>	2/11/57	2,272,146	70,875,002	<i>Prod., SI, and aban.</i>	M
	Beaver Creek	9/26/81	12,074	65,791	Prod.	M
	Blood	2/17/80	128,197	1,430,339	Prod. and SI	M
	Bushnell-	12/31/58	100,168	21,319,668	Prod., SI, and aban.	M
	Lexington					
	Carlson	2/23/81	226,812	1,917,031	Prod. and SI	M
	Forro	1/ 4/58	2,656	49,870	Prod.	M
	Indian Springs	9/11/57	876,258	24,645,206	Prod., SI, and aban.	M
	Kastle	7/14/62	261,924	3,709,465	Prod. and SI	M
	Lundys Lane	11/ 9/61	417,917	8,257,127	Prod., SI, and aban.	M
	Marsh Run	5/20/82	⁴	9,403	Prod. and SI	H
	Mud Run	11/ 5/81	11,415	97,361	Prod. and SI	M
	Pageville	10/10/80	48,535	772,242	Prod. and SI	M
	Pennside	9/ 9/59	39,531	347,132	Prod. and SI	M
	Rogers	4/ 8/82	7,569	42,886	Prod.	O
	Springboro	7/ 7/79	40,487	426,810	Prod. and SI	M
	Stone Run	10/21/79	98,603	1,018,405	Prod. and SI	M
	West Mead	7/ 8/74	⁴	81,937	Prod.	M
		6/17/81	99,851	529,278	Prod. and SI	M
		1/18/79	⁴	79,598	Prod. and SI	M
	<i>TOTAL</i>	7/26/77	2,400,595	24,529,218	<i>Prod. and SI</i>	M
Cussewago	Barco	12/13/80	1,771	40,514	Prod. and SI	M
Crawford and Mercer	East Fairfield	7/31/80	119,334	1,301,316	Prod.	M
Jamestown						
Kantz Corners						

Figure 22. (Continued).

County	Field	Pool	Discovery date	Production 1988 (Mcf) ¹	Cumulative production at end of 1988 (Mcf) ¹	Status of field or pool at end of 1988 ²	Reservoir ³
Crawford and Mercer	Kantz Corners	Mt. Pleasant Road	8/30/80	11,424	193,692	Prod.	M
		Round Knob	11/12/80	65,985	993,558	Prod.	M
		Shaws Corners	7/15/80	175,758	1,921,874	Prod.	M
		Osborn	5/12/81	112,119	1,036,031	Prod.	M
Crawford, Mercer, and Venango	Sheakleyville		9/ 6/81	⁵ 129,757	1,814,641	Prod. and SI	M
			11/16/80	558,275	6,267,767	Prod. and SI	M
		Deckard	11/ 4/80	154,329	960,232	Prod. and SI	M
		McDaniels	3/16/81	94,614	1,120,515	Prod. and SI	M
Crawford and Venango	Breedtown	Gresham	10/ 5/85	825,521	1,068,505	Prod. and SI	M
		Beatty Run	7/30/82	8,107,684	22,091,954	Prod., SI, and aban.	M
		Donation Hill	7/28/88	25,932	25,932	Prod.	L
		McCauley Run	8/22/85	20,447	72,825	Prod.	M
Crawford and Warren	Lake Creek	Wilson Mills	12/22/84	1,746,325	2,801,729	Prod. and SI	M
		Diamond	9/18/87	138,728	188,455	Prod.	M
		Bates Hollow	4/ 8/85	54,957	170,325	Prod.	M
		Hatchtown	6/27/79	471,690	1,745,957	Prod.	M
County Line	Dotyville	Vrooman	12/ 7/79	1,359,360	4,767,810	Prod.	M
		Porky Run	1/31/81	53,390	1,014,111	Prod. and SI	M
		Three Bridge	11/ 5/86	388,794	612,125	Prod.	M
			2/28/81	623,807	1,453,881	Prod. and SI	M
Erie	Alder Run		8/24/74	1,708	646,111	Prod. and SI	M
		Carter Hill	5/14/79	146,652	834,805	Prod. and SI	M
		Macedonia	4/20/84	105,419	467,678	Prod.	H
		Harbor Ridge	10/ 2/79	⁴	62,000	Prod. and SI	M
Concord	Corry	Stewart Road	3/10/80	⁴	36,637	Prod. and SI	M
		TOTAL	4/29/47	170,116	2,015,833	Prod., SI, aban., and gas stor.	M
		Beaver Dam	5/20/53	3,481	369,002	Prod. and SI	M
		Spencer Creek	6/19/70	66,320	210,398	Prod., SI, and aban.	M
Davy Hill	Drumlin	Tarbell	9/12/80	⁴	41,979	Prod.	M
		Pittsfield	9/17/85	⁴	13,262	Prod.	M
		Greenley	10/11/83	⁴	1,054,816	Prod. and SI	H
		Swails	6/27/80	96,783	5,505,858	Prod. and SI	M

Edinboro		7/28/80	29,184	1,460,597	Prod. and SI	M
Edinboro North		1/ 9/80	52,308	6,047,745	Prod. and SI	M
Erie	Conneauttee	10/14/82	912	43,181	Prod.	S
	Bartotic	3/ 7/79	⁴	337,450	Prod.	O
	Blass	2/12/66	1,944	14,846	Prod.	M
	Car Wash	3/ 1/85	⁴	67,214	Prod. and SI	O
	Charter Oaks	5/19/77	71,028	683,327	Prod. and SI	M
	Dunn Valley	1/19/80	3,078	79,914	Prod.	M
	Glenwood	8/ 9/77	948	201,707	Prod. and SI	M
	Goddard	8/31/78	10,466	749,304	Prod. and SI	M
	Talcott	7/ 8/79	35,688	1,932,837	Prod. and SI	M
		6/16/80	68,630	1,142,793	Prod. and SI	M
	Waterford	3/21/77	86,366	7,472,645	Prod. and SI	M
		7/27/79	17,498	6,621,579	Prod. and SI	M
		5/14/78	12,632	1,579,939	Prod. and SI	M
	Pattison	11/ 9/79	⁴	275,172	Prod. and SI	M
	Bailey Brook	1/11/80	427,588	2,452,473	Prod. and SI	M
	Bull Reservoir	9/17/72	33,662	1,406,987	Prod. and SI	M
	Burgess	10/17/60	8,417	3,282,369	Prod. and SI	M
	Delhill Corners	6/23/79	208,473	303,408	Prod. and SI	N
	Half Moon	9/ 6/79	902	7,825	Prod. and SI	M
	Harborcreek	10/20/77	11,813	1,256,317	Prod. and SI	M
	Hornby	6/10/78	⁴	2,020,427	Prod. and SI	M
	Kuhl	8/14/78	4,297	70,080	Prod. and SI	M
	Little Hope	12/ 7/78	6,930	123,440	Prod. and SI	M
	McGuire	2/ 8/80	61,055	61,055	Prod.	O
	Meabon	5/15/86	61,544	284,250	Prod. and SI	N
	Orchard Beach	2/18/74	31,823	3,358,328	Prod. and SI	M
	Wattsburg	4/19/80	20,100	117,067	Prod. and SI	M
	Dennee	7/14/81	75,627	351,147	Prod. and SI	M
		7/ 9/80	31,947	1,432,653	Prod. and SI	M
	Bentley Run	10/13/80	⁴	46,107	Prod. and SI	M
	Emmons	12/30/80	5,397	176,906	Prod. and SI	M
		7/27/78	3,015	172,640	Prod. and SI	M
	Stroup	7/28/80	39,793	190,603	Prod. and SI	M
	Dewey Corners	2/10/81	1,133,184	4,635,401	Prod. and SI	M
	Hare Creek	6/26/81	8,908	152,176	Prod. and SI	M
	Whites Run	10/30/75	250,945	1,147,125	Prod. and SI	M
		8/ 8/63	21,953	52,691	Prod.	O
	Eberly	10/17/85	118,251	284,201	Prod.	O
	Quebec Run	6/ 3/69	3,912	42,494	Prod.	O
		10/13/61	⁴	8,404,801	Prod.	O
Phillipsville						
Reeds Corners						
Union City						
Erie and Warren	Brokenstraw					
Columbus						
Fayette	Feik					
Mill Run						
Sandy Creek						
Spruell						

Figure 22. (Continued).

County	Field	Pool	Discovery date	Production 1988 (Mcf) ¹	Cumulative production at end of 1988 (Mcf) ¹	Status of field or pool at end of 1988 ²	Reservoir ³
Fayette	Summit	North Summit	3/24/38	⁴	21,975,214	Prod.	O
		South Summit	5/ 9/42	⁴	23,153,208	Prod. and SI	O
Fayette and Somerset	Ohiopyle	Cranberry Lake	12/28/59	14,674	4,702,197	Prod., SI, and aban.	O
		Lower	8/23/87	2,151	2,151	Prod.	O
		Turkeyfoot	2/23/88	12,516	12,516	Prod.	N
Fayette and Westmoreland	Jacobs Creek	Bailey	12/26/61	15,086	2,452,251	Prod. and SI	O
Indiana	Cherry Hill	Crichton	1/ 9/63	⁰	3,413,233	SI	O
		Hadden	7/11/63	18,295 ⁴		Prod.	O
	Commodore	Wandin	5/12/81	⁴	544,591	Prod.	O
	Jacksonville	Jacksonville Deep	11/17/56	⁴	30,876,061	Prod. and SI	O
	Lewisville	Serro	5/21/83	⁴	176,662	Prod. and SI	O
	Living Waters	Uniontown	2/21/80	212,499	1,535,008	Prod. and SI	O
	Nolo	Carney Run	4/28/80	⁴	173,923	Prod. and SI	O
Jefferson	Frostburg	Elk Run	6/30/65	37,265	50,048,656	Prod., SI, and aban.	O
McKean	Bradford	Cyclone	2/18/74	⁴	2,242,216	Prod.	N
Mercer	Big Bend	Delaware	9/ 1/83	⁴	2,577	Prod.	M
	Coolspring	Filer Corners	8/ 8/83	9,392	40,915	Prod. and SI	M
	Greenfield		5/17/84	870,854	2,030,493	Prod.	M
	Greenville	Thiel	10/28/81	8,683	89,019	Prod. and SI	M
	Hadley	Derber	9/13/81	101,723	429,337	Prod.	O
		Perry School	8/30/81	10,328	108,487	Prod.	M
	Maysville		11/11/77	⁵ 2,898	61,215	Prod. and SI	M
		West Salem	2/17/81	18,170	146,469	Prod. and SI	M
	New Hamburg	Good Hope	2/ 2/79	17,049	143,416	Prod. and SI	M
	Sharon	Sharon Deep	2/26/78	729,317	2,591,121	Prod. and SI	M
	Stoneboro	Lake	3/ 2/83	36,467	109,978	Prod. and SI	M
	Volant	Pardoe	7/24/81	⁴	9,081	Prod.	M
	Wheatland		7/24/63	321,067	2,007,544	Prod. and SI	M
	Wolf Creek	Kilgore	10/26/66	59,877	5,565,617	Prod. and SI	L
Mercer and Venango	Utica	French Creek	7/26/81	33,552	292,338	Prod. and SI	M
Potter	Ulysses	Newfield	10/ 2/39	⁰	4,765,697	SI	O
			4/ 2/62	31,872 ⁴		Prod. and SI	O
Somerset	Bakersville	Shaffer Run	1/14/79	64,670	588,776	Prod. and aban.	O
			5/ 1/85		266,413	Prod.	O

Boswell	Edie	11/11/58	} ⁴ 23,066 ⁴	12,507,756	Prod. and SI	O
	Quemahoning	10/18/68				
	Snyder	8/ 4/80				
		6/16/60				
Glessner	Weimer	6/ 5/88	397,313	397,313	Prod.	O
Heckman Hollow		8/16/77	⁴	2,216,111	Prod.	O
Kimmel		5/ 9/80	⁵ 10,039	750,811	Prod.	O
		10/22/80	⁴	14,390	SI	O
Paddytown		5/24/85	⁴	647,865	Prod.	O
Rockwood		5/28/79	⁴	743,978	Prod.	O
Shade Creek		10/ 3/77	⁴	1,241,472	Prod.	O
Shamrock		5/10/79	⁴	2,740,302	Prod.	O
Shanksville		9/22/73	⁵ 27,779	5,859,522	Prod.	O
Somerset East		10/ 7/79	⁴	964,169	Prod.	O
Somerset West		1/ 6/78	⁴	2,384,305	Prod.	O
Texas School	Gideon	1/29/84	7,994	45,501	Prod.	O
Barkeyville	Duncan	4/ 5/73	⁴	145,140	Prod.	O
Dempseytown	Mt. Carmel	10/ 6/86	416,722	558,561	Prod.	M
Foster Reno	Victory Run	2/ 1/82	⁴	1,283	Prod. and SI	M
Franklin Oak	Galloway	11/12/73	114,710	523,921	Prod.	M
Forest						
Hamilton Corners	Tecza	7/ 4/86	648,436	684,878	Prod. and SI	M
McCune Run	Canal	5/25/82	1,215,759	5,108,016	Prod. and SI	M
Oakland	Splane	9/22/85	16,101	51,872	Prod. and SI	M
Sugar Creek-Niles	Takitezy	7/26/82	269,274	594,581	Prod. and aban.	M
Toonerville	Cherrytree	3/10/87	33,635	33,635	Prod.	M
Wesley	Irwin	12/ 1/72	⁴	388,331	Prod. and SI	M
Goodwill Hill-	Campbell Creek	11/14/81	778,005	1,244,780	Prod. and SI	M
Grand Valley						
Sanford	Trimm	2/19/81	229,063	774,460	Prod. and SI	M
Spring Creek	West Spring	6/15/84	102,649	171,561	Prod.	M
	Creek					
Stillwater	Freehold	9/26/79	5,914	936,784	Prod. and SI	M
	Savko	8/ 5/80	11,283	634,057	Prod. and SI	M
		9/ 5/80	⁴	702,003	Prod. and SI	M
Sugar Grove	Mikrut	7/21/81	280	11,842	Prod. and SI	M
Youngsville	Pikes Rocks	5/ 1/81	4,617	205,931	Prod. and SI	M
Crabtree	Dry Ridge	8/25/46	⁴	6,563,564	Prod. and SI	O
Lycippus	TOTAL	8/17/49	⁴	6,886,067	Prod.	O
	St. Boniface	9/13/56	⁴	6,146,639	Prod.	O
	Chapel					
New Alexandria	Kahl	10/23/62	154,612	12,339,236	Prod. and SI	O

Figure 22. (Continued).

County	Field	Pool	Discovery date	Production 1988 (Mcf) ¹	Cumulative production at end of 1988 (Mcf) ¹	Status of field or pool at end of 1988 ²	Reservoir ³
Westmoreland and Somerset	Johnstown	Baldwin Beck	5/22/60	1,153,500	13,792,944	Prod.	O
		Penrod	5/16/57		1,153,500	Prod.	O
	Linn Run	Williams	11/20/87	0	19,763,997	SI	O
			2/14/58		683,105	Prod.	O
		Silver Mine	4/25/79	362,287	379,349	Prod.	N
	Seven Springs	TOTAL	4/ 2/87	190,235	11,248,111	Prod., SI, and aban.	O
		Blair Oriskany	12/ 5/58	939,328			
		Tunnel	12/ 5/58	290,960	6,747,291	Prod.	O
		Distillery	3/10/65				
		Laurel Hill	9/20/87		295,823	Prod.	O
		Lookout	3/ 5/81	59,805	310,663	Prod.	O
		Myersbrook	1/14/87	475,028	702,036	Prod.	O
		Seven Springs	7/16/82	15,461	626,090	Prod.	O
		Weaver Road	8/ 3/66	98,074	851,881	Prod.	O
			3/15/84		1,054,553	Prod.	O

¹Mcf, thousand cubic feet.²Aban., abandoned; gas stor., gas storage; prod., producing; SI, shut-in.³N, Onondaga Formation; O, Oriskany Sandstone; H, Helderberg Group/Bass Islands Dolomite; S, Salina Group; L, Lockport Dolomite; M, Medina Group; T, Tuscarora Formation; BE, Bald Eagle Formation.⁴Production not reported by publication deadline.⁵Estimated figure based on 1986 and 1987 production.

Figure 23. Deep gas production in Pennsylvania in 1988 by producing formation.

<i>Producing formation</i>	<i>Production in 1988 (Mcf)¹</i>	<i>Cumulative production at end of 1988 (Mcf)¹</i>
Marcellus Formation (deep black shale)	0	75,930
Onondaga Limestone	475,186	3,294,537
Oriskany Sandstone, Huntersville Chert, and Ridgeley Sandstone ...	4,466,006	1,287,977,727
Bass Islands Dolomite and Helderberg Group	69,170	1,517,850
Salina Group	912	43,181
Lockport Dolomite	85,809	5,621,053
Medina Group	31,091,053	243,556,123
Tuscarora Sandstone	102,330	3,868,840
Bald Eagle Formation	476,658	3,093,992
Gatesburg Formation and Little Falls Dolomite	0	207,200
TOTAL	36,767,124	1,549,256,433

¹Mcf, thousand cubic feet.

Figure 30 illustrates the stratigraphic positions and relationships of the shallow reservoirs in western Pennsylvania.

Some interesting shallow exploratory tests were reported in Pennsylvania in 1988. Two new shallow fields and four new shallow pools were discovered in the Venango, Bradford, and Elk Groups and the Brallier Formation in Clearfield, Elk, and Fayette Counties (Figures 27 and 28). The two new fields represent important discoveries in the Upper Devonian Venango Group and Scherr Formation. The Venango discovery, the Rasler Run field in Fayette County, occurred in the Somerset Exploration #1 Detwiler well. The open flow for this well was 1,160 Mcfgpd natural from the Bayard sand. The Scherr discovery is especially significant, despite the low open flow, because it established a new shallow reservoir in Pennsylvania. The Scherr, an equivalent of the Elk Group, crops out in central Pennsylvania, Maryland, and West Virginia. It occurs in the subsurface in western Pennsylvania only in limited areas of eastern Cambria and Somerset Counties. The discovery well, the EPI Drilling Company #1 Monahan, opened the Dutchtown field near Ebensburg in Cambria County. The well had a reported after-treatment open flow of only 50 Mcfgpd, but at last report the company was planning on eventually producing the well.

Open flows in the four new shallow pools were small to average, but the wells are considered significant because of distance, or depth to new reservoirs, from existing production. The Carnegie Natural Gas #1 Mason well was the discovery well of the Woods Run pool in the Fordyce field in southeast-

ern Greene County. Natural gas flowed 375 Mcfgpd from the Brallier Formation at 5,027 feet after treatment. This well, completed in 1983, represents a continuation of drilling and new pool discoveries in the thin siltstones of the deeper Brallier (Elk equivalent) begun by Kepco, Inc., in 1982. Kepco's activity resulted in the discovery of 8 or 10 such deeper pools in the established Venango oil and gas fields of Greene County. In Elk County, CNG Development completed a 3,035-foot test of the Bradford Group in the Punxsutawney-Driftwood field that had an after-treatment open flow of 70 Mcfgpd. The #2 Commonwealth of Pennsylvania Tract 29 well was the discovery well of the Barr Hollow pool. Empire Exploration completed a 2,700-foot test of the Bradford and Elk Groups in the small Rocky Run field near Ridgway in Elk County. The #2 M. C. Overton well flowed 107 Mcfgpd after treatment in both reservoirs and was the discovery well of the Daguscahonda pool in the Elk Group. The fourth new pool, Lack pool in the Madera field, Clearfield County, was a deeper pool discovery in the Elk Group completed by Fairman Drilling Company. The discovery well, the #3 Arthur and Rosalie Lack well, flowed 337 Mcfgpd after treatment from the commingled Bradford and Elk Groups at 3,126 to 4,400 feet.

Development drilling for gas production from Lock Haven Formation sandstones in Centre and Clinton Counties continued in 1988. Discovery of an unusually large natural open flow of gas in the Council Run field, Centre County, in 1981 by Eastern States Exploration Company started the activity. The Council Run field has produced in

Figure 24. *Production, unit price, and total value of crude oil and natural gas produced in Pennsylvania, 1960–88.*

Year	CRUDE OIL			NATURAL GAS			Total oil and gas value (dollars)
	Production ¹ (bbl)	Average yearly price (dollars/bbl)	Total value (dollars)	Production ² (Mcf) ⁴	Average yearly price ³ (dollars/Mcf) ⁴	Total value (dollars)	
1960	5,942,000	4.57	27,154,940	119,671,000	0.26	31,114,460	58,269,400
1961	5,580,000	4.76	26,560,800	98,318,000	.26	25,562,680	52,123,480
1962	5,238,000	4.63	24,251,940	87,308,000	.26	22,700,080	46,952,020
1963	5,014,000	4.63	23,214,820	92,340,000	.26	24,008,400	47,223,220
1964	5,113,000	4.48	22,906,240	85,322,000	.26	22,183,720	45,089,960
1965	4,859,000	4.20	20,407,800	82,668,000	.26	21,493,680	41,901,480
1966	4,349,000	4.33	18,831,170	91,365,000	.26	23,754,900	42,586,070
1967	4,409,000	4.35	19,179,150	89,966,000	.26	23,391,160	42,570,310
1968	4,160,000	4.35	18,096,000	87,987,000	.28	24,636,360	42,732,360
1969	4,448,000	4.29	19,081,920	79,134,000	.26	20,574,840	39,656,760
1970	4,015,000	4.27	17,144,050	77,535,000	.27	20,934,450	38,078,500
1971	3,798,000	4.47	16,977,060	76,451,000	.30	22,935,300	39,912,360
1972	3,441,000	4.60	15,828,600	73,958,000	.45	33,281,100	49,109,700
1973	3,282,000	5.73	18,805,860	78,514,000	.45	35,331,300	54,137,160
1974	3,399,000	8.43	28,653,570	82,735,000	.50	41,367,500	70,021,070
1975	3,199,000	9.26	29,622,740	84,772,000	.80	67,817,600	97,440,340
1976	2,950,000	11.51	33,954,500	89,974,000	.85	76,477,900	110,432,400
1977	2,659,000	14.22	37,810,980	92,293,000	1.00	92,293,000	130,103,980
1978	2,820,000	14.77	41,651,400	97,763,000	1.25	122,203,750	163,855,150
1979	2,817,000	23.67	66,678,390	96,313,000	1.40	134,838,200	201,516,590
1980	2,940,000	37.42	110,014,800	97,439,000	1.50	146,158,500	256,173,300
1981	3,729,000	36.33	135,474,570	122,454,000	2.00	244,908,000	380,382,570
1982	4,282,000	31.42	134,540,440	121,111,000	2.80	339,110,800	473,651,240
1983	4,491,000	28.18	126,556,380	118,372,000	3.00	355,116,000	481,672,380
1984	4,825,000	27.64	133,363,000	166,342,000	3.25	540,611,500	673,974,500
1985	4,851,000	25.12	121,857,120	150,541,000	3.15	474,204,150	596,061,270
1986	3,783,000	15.66	59,241,780	159,889,000	2.50	399,722,500	458,965,642
1987	3,302,000	17.23	56,893,460	163,318,000	2.25	367,465,500	424,358,960
1988	2,807,000	15.79	44,322,530	167,089,000	2.25	375,950,250	420,272,780

¹Oil production figure courtesy of the Penn Grade Crude Association.²Gas production figure courtesy of the American Gas Association.³Gas prices estimated only.⁴Mcf, thousand cubic feet.

excess of 5 Bcf (billion cubic feet) of gas since the discovery well went on line in 1983, spurring unprecedented interest in north-central Pennsylvania. In 1988, 60 new wells were reported from Centre and Clinton Counties, most of which were drilled to prospective Lock Haven targets. Three of these wells, the #1 Arthur Rydberg, the #20 Commonwealth of Pennsylvania Tract 255, and the #42 William Litke, all drilled by Eastern States Exploration, were completed in the Council Run field and had large natural open flows ranging from 1,366 to 4,900 Mcfgpd. Wells such as these are not unusual in the Council Run field, and operators are busily searching for similar production throughout the region.

Not all exploratory and development drilling for shallow reservoirs was successful in 1988. Nine

shallow exploratory wells reported during the year resulted in dry holes (Figure 29). Empire Exploration and Viking Resources each drilled one unsuccessful new field wildcat in the Elk Group sandstones of Elk and Lycoming Counties. Six unsuccessful new field and new pool wildcats were drilled by CNG Development, Doran and Associates, Eastern States Exploration, and Empire Exploration in the Lock Haven Formation in Centre and Clinton Counties. The final unsuccessful shallow exploratory well was a test of the Devonian shales in an established Medina Group field in Crawford County.

Although deep drilling typically results in fewer total wells than shallow drilling, the deep wells commonly are more important because they are more likely to lead to the discovery of new reservoirs, establish significant new reserves, and add more to

Figure 25. *Exploratory and primary development and drilling footages reported, 1988 and 1987.*

<i>Type of well</i>	<i>1988 Wells</i>	<i>1988 Footage</i>	<i>1987 Wells</i>	<i>1987 Footage</i>	<i>Percent change in footage</i>
Exploratory					
Gas	41	220,025	54	289,721	
Oil	1	3,685	2	8,838	
Dry	27	122,686	20	116,175	
Total (percent successful)	69 (61 %)	346,396	76 (74 %)	414,734	- 17
Development					
Gas	1,256	5,388,952	942	3,801,983	
Oil	316	439,225	942	1,154,298	
Oil and gas	27	54,561	9	15,655	
Dry	48	149,132	44	139,400	
Total (percent successful)	1,647 (97 %)	6,031,870	1,937 (98 %)	5,111,336	+ 18
Miscellaneous					
Water intake	42	97,770	53	125,567	
Stratigraphic core tests	4	9,627	11	25,748	
Gas storage	2	8,376	6	31,960	
Gas storage observation	2	3,022	0	0	
Junked	3	10,785	2	320	
Total	53	129,580	72	183,595	- 29
TOTAL ALL WELLS DRILLED	1,769 (96 %)	6,507,846	2,085 (97 %)	5,709,665	+ 14

our knowledge of subsurface geology. The standard deep horizons in Pennsylvania include the Middle Devonian Huntersville Chert and Lower Devonian Ridgeley Sandstone in the eastern Plateau area, and the Lower Silurian Medina Group in the northwestern part of the state. Subsidiary production has historically been limited from the carbonate and evaporite rock sequence between the Middle Devonian Onondaga Limestone and Middle Silurian Lockport Dolomite in northwestern Pennsylvania, from the Upper Ordovician Bald Eagle Formation in north-central Pennsylvania, and from the Upper Cambrian Gatesburg Formation in the northwestern part of the state. Shale-gas production from the Middle Devonian Marcellus Formation occurs sparsely, except in Erie County, and is normally lumped with Upper Devonian shale gas as shallow production. Deep formations discussed here are shown in Figure 31.

A new deep reservoir was added to Pennsylvania's inventory in 1988 when gas was discovered in the Middle Devonian Tully Limestone through the drilling of the Wilmoth Interests #1 Creel well. The Tully has long been considered an important stratigraphic marker horizon in Pennsylvania but it had never had more than a few isolated reports of gas shows, and therefore had never been con-

sidered as a potential reservoir. This is especially interesting because completion of a gas well in the Tully in New York was the event that spurred the deep-drilling furor that occurred throughout the Appalachian basin in the 1930's and 1940's. The Creel well, consisting of a primary vertical hole and two inclined sidetracks, was drilled as deep as the Lower Devonian-Upper Silurian Keyser Formation and was stimulated in the Middle Devonian Tully Limestone, Marcellus Formation, and Huntersville Chert. The Huntersville proved to be unproductive in the well, but the Tully and Marcellus flowed a combined 60 Mcfgpd in the first test. Disappointed at the small result, the company shut the well in for about 6 months. The next time it was tested, it was determined to have a significant enough flow to warrant putting the well on line. The Creel well was the discovery well of the Creel pool in the Queen Junction field, northern Butler County.

Reported drilling for oil and gas in the Middle Devonian Onondaga Limestone continued in Pennsylvania in 1988, but at a much reduced rate. A new Onondaga oil pool was discovered early in the year. The Cobb Corners pool in Warren County was discovered through the drilling of the Doran and Associates #1 Rensma-Cobb well, a 3,685-foot test in the County Line field. Most of the wells in the

Figure 26. *Exploratory drilling in Pennsylvania by classification and type of well, 1988.*

<i>Classification and type of well</i>	<i>No. of wells</i>	<i>Footage</i>
NEW FIELD WILDCATS		
Gas	5	33,990
Dry	15	81,248
Subtotal	20	115,238
NEW POOL WILDCATS		
Gas	7	42,532
Dry	1	5,002
Subtotal	8	47,534
DEEPER POOL TESTS		
Gas	3	16,593
Dry	1	6,954
Subtotal	4	23,547
SHALLOW POOL TESTS		
Gas	1	5,635
Oil	1	3,685
Dry	2	4,762
Subtotal	4	14,082
OUTPOST EXTENSIONS		
Gas	25	121,275
Dry	8	24,720
Subtotal	33	145,995
GRAND TOTAL EXPLORATORY WELLS		
	69	346,396

field produce gas from the Medina Group sandstones. The well record submitted by the operator reported only a show of oil and gas in the well, suggesting that it was a dry hole. Production reports, however, indicate that the well produced a significant amount of oil during 1988. This corrects earlier reports published in trade magazines that reflected the initial status of the well.

In other Onondaga activity, only two wells were reported in the Meabon pool in the North East field, Erie County, during the year, and both wells were actually completed in mid-1987. The Vineyard Oil and Gas Company #1 Biletnikoff well had an after-treatment open flow of 300 Mcfgpd from the Onondaga at 2,644 feet. The #8 Meabon well, also drilled by Vineyard, was completed as a combination oil and gas well. The well blew in at 2,600 feet with an estimated open flow of 500 Mcfgpd. After being deepened to 2,771 feet, the well was stimulated in the Onondaga at 2,726 feet, where it produced an open flow of 1,000 Mcfgpd and 100 bopd.

The Lower Devonian Oriskany Sandstone, a northwestern equivalent of the prolific Ridgeley Sand-

stone, occurs as patches of sandstone that accumulated in topographic lows interpreted to have resulted from salt solution in the underlying Salina Group. Many of these patches were later altered by subtle folding, resulting in very low relief anticlines capable of trapping water and hydrocarbons. The Oriskany has had a history of production almost as patchy as its occurrence. Newly completed wells commonly flow at unusually high rates, often in millions of cubic feet per day without stimulation, but total production is commonly limited by the intrusion of water into the reservoir. Many of the wells completed in the Oriskany in the past 20 years produced gas for only a year or two before either being abandoned or drilled deeper to more stable Medina reservoirs. Part of the problem apparently stems from drilling through the reservoir, thereby connecting the wet zones with the gas zones. Some operators have discovered that the wells last longer if drilling stops within the upper few feet of the sandstone. Three new Oriskany wells that have high natural open flows were reported in Erie County in 1988, and two of these were completed within 4 feet of the top of the formation. The N.E.A. Cross #1 Tomczak, NRM Petroleum #1 Farak, and Mid American Natural Resources #1 Lease wells were all drilled in the Bartosic pool, Erie field. Drilling ceased in the Tomczak well at the top of the Oriskany, and the well flowed 3,000 Mcfgpd without stimulation. The Farak well was completed approximately 4 feet into the Oriskany and had a natural open flow of 5,000 Mcfgpd. The Lease well, which penetrated into the Silurian Bass Islands Group beneath the Oriskany, had a considerably lower natural open flow than the other two wells, only 700 Mcfgpd. It is uncertain how long these wells will produce.

During the last 15 years drilling in the Middle Devonian Huntersville Chert and Lower Devonian Ridgeley Sandstone (Oriskany of drillers) has been greatly overshadowed by drilling to the Lower Silurian Medina Group in northwestern Pennsylvania. For each Devonian deep well drilled, the industry has reported between 20 and 50 Medina wells. The Medina has proved to be a "sure thing," the sort of reservoir that produces gas, and in some places a little oil, in about 98 percent of the wells drilled into the formation. Medina wells typically produce no more than 200 or 300 Mmcft of gas over their 15- to 20-year life spans. Huntersville-Ridgeley wells, on the other hand, may produce volumes in the billions of cubic feet per well, but there is significantly more risk involved. Where Medina production occurs chiefly in stratigraphic traps,

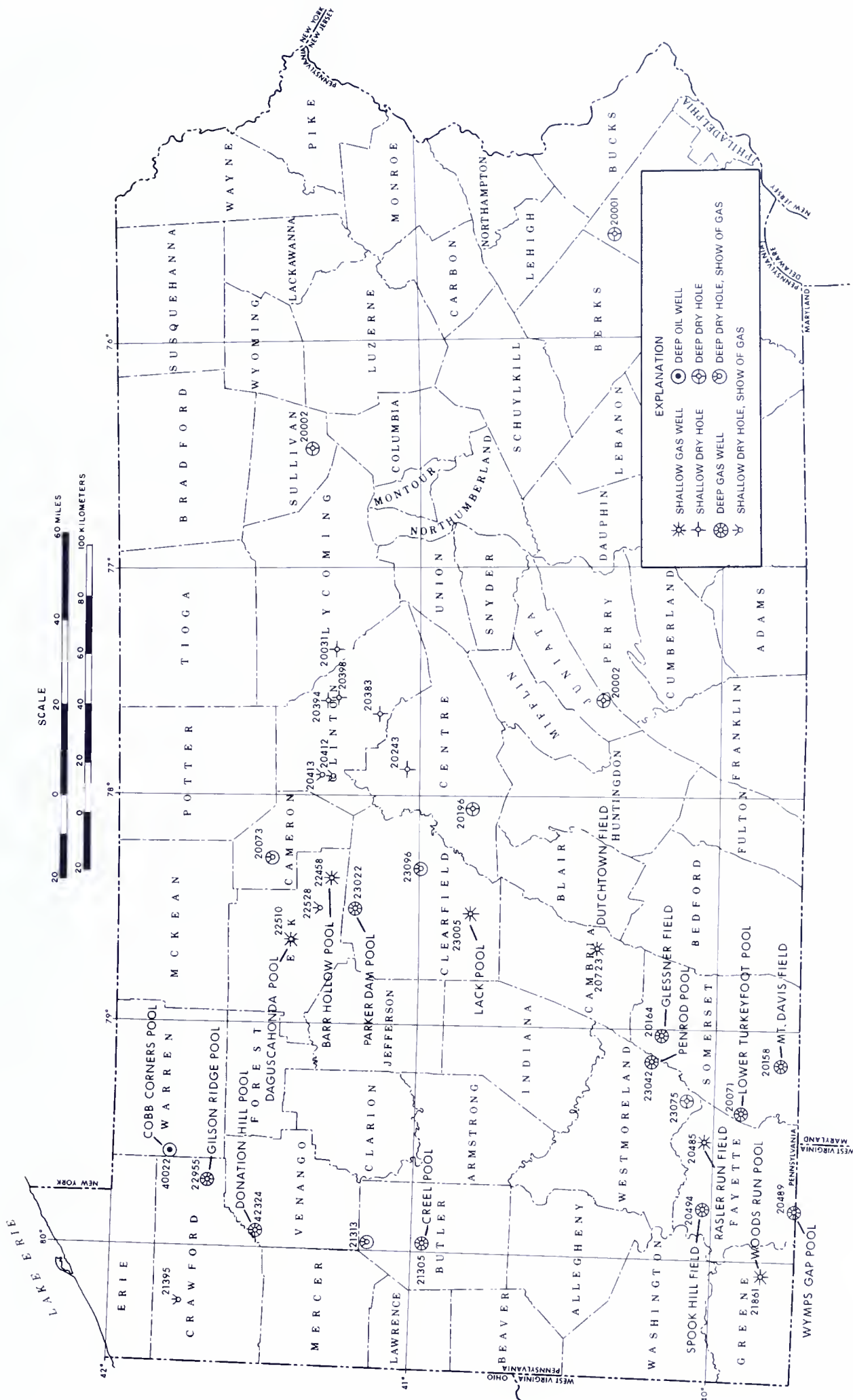


Figure 27. Map of exploratory wells in Pennsylvania reported in 1988.

Figure 28. Reported new field and new pool discoveries in Pennsylvania, 1988.

County and permit no.	Quadrangle	Operator Well no. and lease	Completion date	Total depth (feet)	Formation or group at T.D. ²	Prod. depth (feet)	Producing formation or group ²	Initial daily prod. (Mcf) ³	Field or pool (and field) name	Explor. class ¹ and type of well
Butler 019-21305	Mount Chestnut	Wilmoth Interests, Inc. Creel, Clarence #1	9/28/87	5,822	Keyser (S)	5,552	Tully/Marcellus (D)	60	Creel pool (Queen Junction)	DPD
Cambria 021-20723	Ebensburg	EPI Drilling Co., Inc. Monahan, D. and J. #1	8/14/87	5,202	Brallier (D)	5,188	Scherr (D)	50	Dutchtown field	NFD
Clearfield 033-23005	Irvona	Fairman Drilling Co. Lack #3	10/23/87	4,760	Brallier (D)	4,400	Elk (D)	337	Lack pool (Madera)	DPD
Clearfield 033-23022	Huntley	Equitable Resources Exploration Parker Dam #1	3/16/88	7,163	Helderberg (D)	6,955	Ridgeley (D)	2,318	Parker Dam pool (Punxsutawney-Driftwood)	NPD
Crawford 039-22955	Titusville North	Quaker State Corp. Turk #1	11/25/87	5,422	Queenston (O)	5,275	Medina (S)	1,500	Gilson Ridge pool (Church Run)	NPD
Elk 047-22458	Dents Run	CNG Development Co. Commonwealth of Pennsylvania Tract 29 #2	9/29/87	3,035	Elk (D)	2,398	Bradford (D)	70	Barr Hollow pool (Punxsutawney-Driftwood)	NPD
Elk 047-22510	Ridgway	Empire Exploration, Inc. M. C. Overton #2	3/ 9/88	2,700	Elk (D)	2,491	Bradford/Elk (D)	107	Daguschahonda pool (Rocky Run)	NPD
Fayette 051-20485	Donegal	Somerset Exploration Corp. Detwiler #1	2/16/88	3,175	Bradford (D)	2,034	Venango (D)	1,160	Rasler Run field	NFD
Fayette 051-20489	Lake Lynn	R. E. Fox and Associates Marietta Corp. #1	4/18/88	7,992	Helderberg (D)	7,820	Ridgeley (D)	704	Wymps Gap pool (Summit)	NPD
Fayette 051-20494	Seven Springs	CNG Development Co. Speyer #1	11/14/88	7,741	Helderberg (D)	7,546	Huntersville/Ridgeley (D)	1,716	Spook Hill field	NFD
Greene 059-21861	Garards Fort	Carnegie Natural Gas Co. Mason #1	11/22/83	6,011	Brallier (D)	5,027	Brallier (D)	375	Woods Run pool (Fordyce)	DPD
Somerset 111-20071	Kingwood	Doran and Associates, Inc. Commonwealth of Pennsylvania Tract 111-A #1	2/23/88	8,278	Ridgeley (D)	8,034	Huntersville (D)	1,036	Lower Turkeyfoot pool (Ohiopyle)	NPD
Somerset 111-20158	Markleton	CNG Development Co. Commonwealth of Pennsylvania Tract 280 #1	10/16/87	8,997	Helderberg (D)	8,788	Huntersville/Ridgeley (D)	1,500	Mt. Davis field	NFD
Somerset 111-20164	Boswell	CNG Development Co. Keyser, W. #1	6/ 5/88	8,875	Helderberg (D)	8,707	Ridgeley (D)	7,500	Glessner field	NFD
Venango 121-42324	Sugar Lake	Cabot Oil and Gas Corp. Rock, W. J. #1	7/28/88	5,635	Queenston (O)	5,263	Lockport (S)	600	Donation Hill pool (Cooperstown)	SPD
Warren 123-40022	Spring Creek	Doran and Associates, Inc. Rensma-Cobb #1	1/14/88	3,685	Onondaga (D)	3,685	Onondaga (D)	3,685	Cobb Corners pool (County Line)	SPD
Westmoreland 129-23042	Ligonier	CNG Development Co. Mellon Bank #1	11/20/87	7,942	Helderberg (D)	7,722	Huntersville/Ridgeley (D)	6,500	Penrod pool (Johnstown)	NPD

¹NFD, new field discovery; NPD, new pool discovery; DPD, deeper pool discovery; SPD, shallower pool discovery.²(D), Devonian; (S), Silurian; (O), Ordovician.³Mcf, thousand cubic feet.

Figure 29. Selected exploratory failures reported in Pennsylvania, 1988.

County and permit no.	Quadrangle	Operator Well no. and lease	Completion date	Total depth (feet)	Unit, formation, or group at T.D. ¹	Explor. class ²
Butler 019-21313	Barkeyville	Cabot Oil and Gas Corp. Sherman #1	6/ 7/88	6,954	Queenston (O)	DPT
Cameron 023-20073	West Creek	CNG Development Co. Keystone Manor #1	12/ 9/87	6,060	Helderberg (D)	NFW
Centre 027-20196	Port Matilda	Eastern States Exploration Co. R. and L. Stiver #1	10/24/87	3,762	Helderberg (D)	SPT
Centre 027-20243	Snow Shoe	Empire Exploration, Inc. C and K Coal Co. #5	7/26/87	4,881	Lock Haven (D)	NFW
Clearfield 033-23096	Wallacetown	Fairman Drilling Co. Kassab Unit #1	8/23/88	7,884	Helderberg (D)	NFW
Clinton 035-20383	Howard NW	CNG Development Co. Commonwealth of Pennsylvania Tract 250 #2	10/25/87	5,014	Lock Haven (D)	NFW
Clinton 035-20394	Glen Union	Eastern States Exploration Co. Flory, R. #1	5/17/88	4,290	Lock Haven (D)	NFW
Clinton 035-20398	Glen Union	Eastern States Exploration Co. Commonwealth of Pennsylvania Tract 264 #3	6/ 6/88	4,751	Lock Haven (D)	NFW
Clinton 035-20412	Keating	Doran and Associates, Inc. Pennzoil Tract 646 #1	10/26/88	4,506	Lock Haven (D)	NFW
Clinton 035-20413	Keating	Doran and Associates, Inc. Pennzoil Tract 648 #1	10/25/88	5,002	Lock Haven (D)	NPW
Crawford 039-21395	Edinboro South	Flanigan, Peter C. and Associates Kellerman #1	10/ 1/81	1,000	Ohio (D)	SPT
Elk 047-22528	Weedville	Empire Exploration, Inc. McClintick #1	2/18/88	2,830	Elk (D)	NFW
Juniata 067-20002	McCoysville	Ridge Creek Gas and Oil Co., Inc. Ennist #2	7/22/88	5,286	McKenzie (S)	NFW
Lycoming 081-20030	Trout Run	M. A. T. Oil and Gas Exploration Tiadaghton Forest #1	10/27/88	127	Pleistocene (Q)	NFW
Lycoming 081-20031	Waterville	Viking Resources Corp. Tract 728 #1	11/28/88	4,112	Elk (D)	NFW
Montgomery 091-20001	Sassamansville	North Central Oil Corp. #1 Joseph Parestis	12/29/87	35,764	Newark (T)	NFW
Sullivan 113-20002	Elk Grove	CNG Development Co. Dieffenbach Unit #1	7/24/88	17,581	Beekmantown (O)	NFW
Westmoreland 129-23075	Seven Springs	Somerset Exploration Corp. Kalp #1	1/22/88	7,880	Helderberg (D)	NFW

¹(O), Quaternary; (T), Triassic; (D), Devonian; (S), Silurian; (O), Ordovician.²NFW, new field wildcat; NPW, new pool wildcat; DPT, deeper pool test; SPT, shallower pool test.³Plugging depth 5,764 feet; unofficial total depth 6,718 feet.

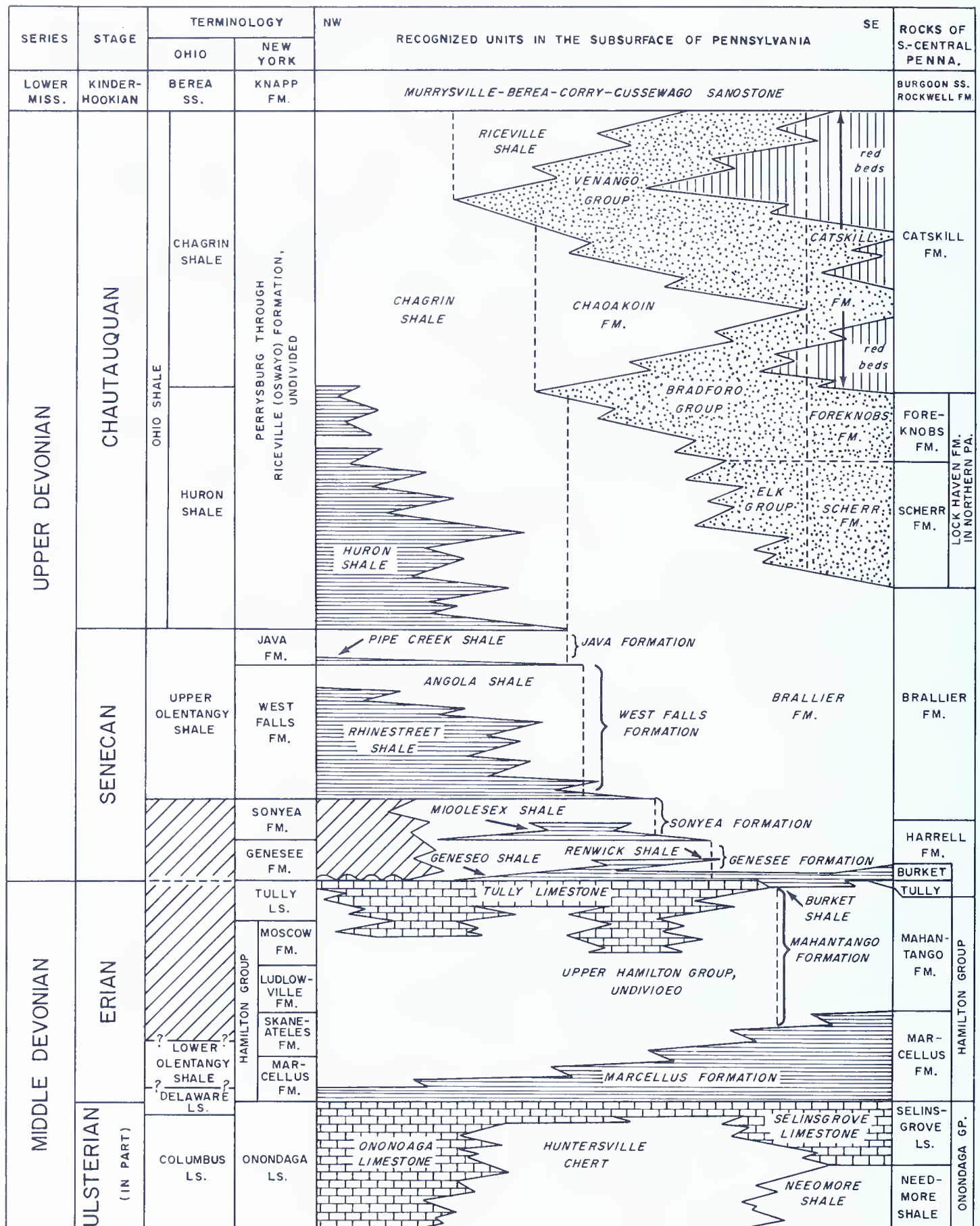


Figure 30. Schematic diagram of Upper and Middle Devonian stratigraphic units from the surface and subsurface of western Pennsylvania.

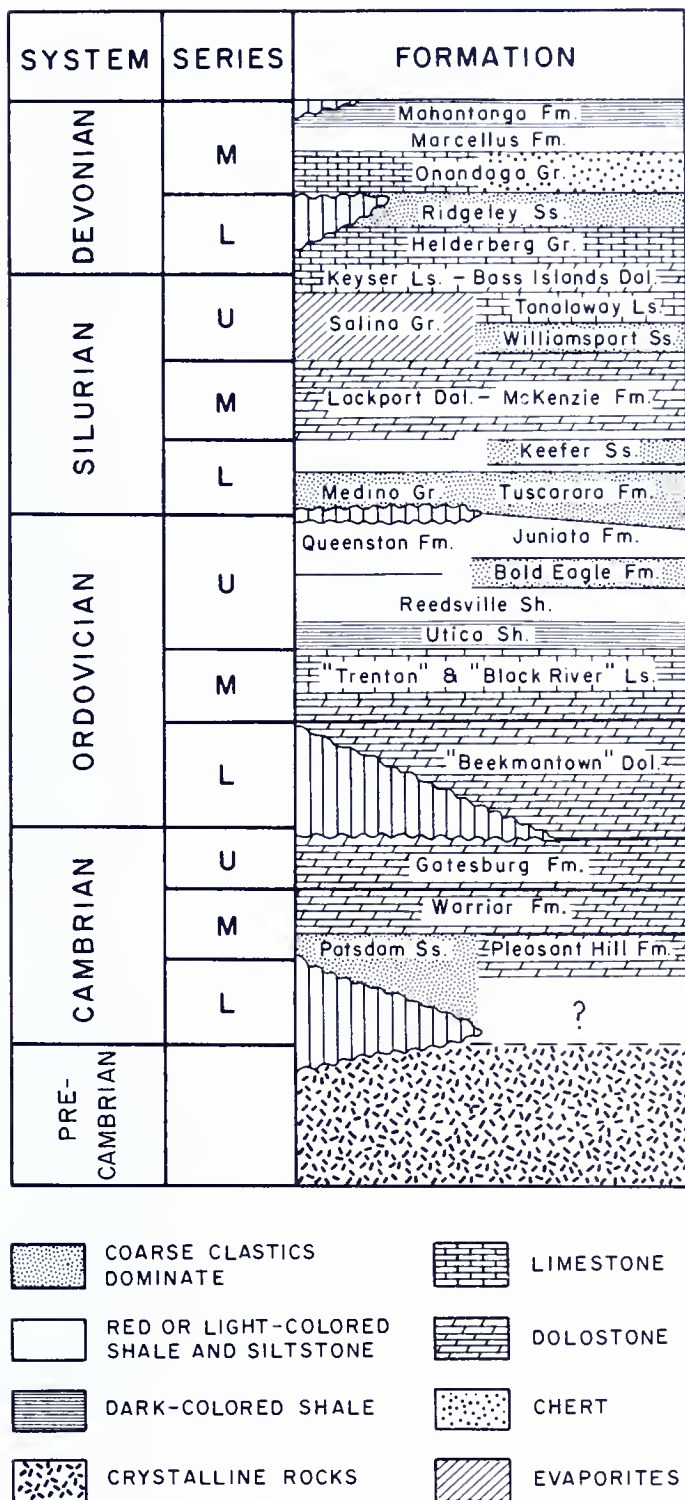


Figure 31. Generalized diagram of the major deep (Tully or deeper) formations occurring in the subsurface of western Pennsylvania.

Huntersville-Ridgeley production occurs mainly in structural traps that require intensive exploratory research to find.

Exploration for new production and reserves in the Huntersville and Ridgeley in western and cen-

tral Pennsylvania continued unabated into 1988. Pennsylvania's gas industry discovered seven new fields and pools in the Huntersville and/or Ridgeley. These included the (1) Penrod pool in the Johnstown field, Westmoreland County; (2) Lower Turkeyfoot pool in the Ohiopyle field, Somerset County; (3) Spook Hill field, Fayette County; (4) Wymys Gap pool in the Summit field, Fayette County; (5) Glessner field, Somerset County; (6) Mt. Davis field, Somerset County; and (7) Parker Dam pool in the Punxsutawney-Driftwood field, Clearfield County.

The Penrod pool was discovered through the drilling of the CNG Development #1 Mellon Bank well, a 7,942-foot test. The pool is a separate fault block in the structural plays of commingled Huntersville and Ridgeley along the Laurel Hill anticline. The well produced 6,500 Mcfgpd after treatment and had a gauged pressure of 2,350 psi (pounds per square inch) after 2 days. The Lower Turkeyfoot pool, another fault-block play on Laurel Hill, extended the established Ohiopyle field to the south. The Doran and Associates #1 Commonwealth of Pennsylvania Tract 111-A was the discovery well for this pool in the Huntersville Chert at 8,034 feet. The well had an after-treatment open flow of 1,036 Mcfgpd and a rock pressure of 3,200 psi after 5 days. CNG Development discovered the new Spook Hill field in Fayette County with the #1 Darthea Speyer well. The well was treated in the Huntersville and Ridgeley intervals from 7,396 feet through 7,546 feet and had an open flow of 1,716 Mcfgpd. The Spook Hill field occurs approximately halfway between the axes of the Laurel Hill anticline and the Ligonier syncline to the west, suggesting that it is situated on a distal flank fault of the anticline.

R. E. Fox and Associates drilled the #1 Martin Marietta Corporation well in the area south of the Summit gas field along the Chestnut Ridge anticline in Fayette County. The Summit field has produced gas from the Huntersville and Ridgeley since being discovered in 1937, but the last producing well in the field was drilled in 1960. The Martin Marietta well is doubly significant, therefore, in establishing a new pool, Wymys Gap pool, in the Summit field and in extending production in the field southward toward West Virginia. The well was treated in the Ridgeley at 7,820 feet and produced an open flow of 704 Mcfgpd.

The Glessner field was discovered through the drilling of the CNG Development #1 William Keyser

well in Jenner Township, Somerset County. The structure involved is located approximately halfway between Laurel Hill anticline and the Boswell dome to the east. In all probability, the field is situated on one of the numerous thrust blocks that can be interpreted from seismic surveys across Somerset County. The Keyser well produced 7,500 Mcfgpd without stimulation from the Ridgeley Sandstone at 8,707 feet. The Mt. Davis field occurs on the Negro Mountain anticline in south-central Somerset County. The field is situated about 5 miles northeast of the Negro Mountain field, which occurs mainly in Maryland, on the same anticline. The field was discovered through the drilling of the CNG Development #1 Commonwealth of Pennsylvania Tract 280 well. This well had an open flow of 1,500 Mcfgpd from the Ridgeley at 8,788 feet.

The Parker Dam pool is located between the two main Ridgeley reservoirs within an area of structural offset in the Punxsutawney-Driftwood field. To the southwest is the Rockton pool, discovered in 1955, and to the northeast is the Benezette pool, discovered in 1953. The Parker Dam pool was discovered through the drilling of the Equitable Resources Exploration #1 Parker Dam Unit well. The well, completed early in 1988, had a natural open flow of 422 Mcfgpd and an after-treatment open flow of 2,318 Mcfgpd.

In addition to these seven new discovery wells, the industry also reported four unsuccessful, but significant, exploratory wells drilled to find gas in the Ridgeley and/or Huntersville section. Three were new field wildcats drilled by CNG Development, Fairman Drilling, and Somerset Exploration. The fourth was a shallower pool test of the Black Moshannon field in Centre County and was drilled by Eastern States Exploration. The Black Moshannon field was discovered through a well drilled in the Lower Silurian Tuscarora Sandstone in 1982, but current production is only from a few wells in the Upper Devonian Brallier Formation (Rush pool).

There were 626 new wells reported from the Medina Group fields of northwestern Pennsylvania in 1988.

The Middle Silurian Lockport Dolomite has had a sporadic history of drilling and production in Pennsylvania. Only a few pools have been discovered in the state, and most operators are unwilling to explore for new reservoirs. The largest and most productive pool to date, Kilgore pool in Mercer County, occupies a high-porosity reef rubble zone situated on the southwestern flank of the Henderson dome, one of the few major structures in northwestern Pennsylvania. The Kilgore pool produced

in excess of 5.5 Bcf of natural gas since it was discovered in 1966 (Figure 22). Such production is unusual, however, because the Lockport commonly contains unsatisfactory quantities of "black water" and/or "sour gas" in the porous zones ("black water" is brine saturated with bitumen compounds; "sour gas" is hydrogen sulfide, a particularly poisonous gas). This track record has discouraged most operators from actively searching for Lockport reservoirs, and those reservoirs that are discovered are typically found by serendipity. Operators drilling known targets in the Lower Silurian Medina Group may notice an interesting or unusual indication on the geophysical logs run in the well bore, or the well may "blow out" in the Lockport section during drilling. Further work may then indicate whether the well is capable of producing from that zone. In 1988 one new Lockport well was reported in Pennsylvania, a significant discovery in terms of both the reservoir and its production. The Cabot Oil and Gas #1 W. J. Rock well was the discovery well of the Donation Hill pool in the Cooperstown field, Venango County. The well was drilled to the Medina Group at 5,635 feet, but was completed in the Lockport interval from 5,214 to 5,263 feet. After stimulation, the well flowed 600 Mcfgpd and had a rock pressure of 1,140 psi. It is hoped that this discovery may help encourage the industry to search for similar production in this underrated formation.

In 1985 the Bureau of Oil and Gas Management established a new office in Meadville, Crawford County, and moved all of the records on wells from the northern tier of counties to that office. During the move, and for a short time afterward, the Bureau of Oil and Gas Management and the Oil and Gas Geology Division of the Pennsylvania Survey suffered from a disruption in record sharing. Numerous well records that had been received by Oil and Gas Management were not passed on to the Survey, despite the best efforts of personnel in both bureaus. As a result, many Medina wells were filed without being reported to the Survey and thus were "lost" due to the disruption; they are now known by the Survey to exist only because of the current requirement to report production. The Survey and the Meadville office of Oil and Gas Management will continue to search for these "lost" wells and will report on them in future editions of this report.

Only one new Medina pool was reported discovered in Pennsylvania in 1988. Quaker State Corporation discovered the Gilson Ridge pool in the Church Run field, Crawford County, through the drilling of the #1 Turk well. The well was completed with an open flow of 1,500 Mcfgpd after treatment. An unsuccessful deeper pool test in the Branchton

field, Butler County, was drilled by Cabot Oil and Gas. The #1 Samuel Sherman well had an after-treatment open flow of only 250 Mcfgpd, and the well was abandoned.

The most significant Medina well was not an exploratory well. Its significance lies in the method of drilling and completion. The McCormick Resources #1 Vanderhoff well was planned, drilled, and completed as a horizontally drilled well in the Grimsby Formation of the Medina Group. The well was drilled vertically to the top of the Middle Silurian Lockport Dolomite at about 4,600 feet, where it reached the kick-off point. The hole curved downward into the Medina and ran about 1,500 feet horizontally through the sandstones of the Grimsby, reaching a total "depth" of 7,047 feet within a true vertical depth estimated at 5,130 feet. The company stimulated the interval 6,151 feet to 6,835 feet without success, but the well produced a gauged open flow of 1,000 Mcfgpd and had a rock pressure of 1,090 psi in 48 hours despite the failure of the formation to break down. It is unclear whether McCormick or any other companies plan to drill more horizontal wells in the Medina in the future.

Three test wells drilled east of the established oil and gas fields of the Appalachian Plateau were reported in 1988. Two of these were deep or ultra-deep wells in the "Eastern Overthrust Belt," and the third was a test of the Mesozoic rocks of the Newark basin in southeastern Pennsylvania.

The Ridge Creek Gas and Oil Company completed the #2 Ennist in Tuscarora Township, Juniata County, as a 5,286-foot dry hole. The well started in Middle Devonian Hamilton Group shales and limestones and reached total depth in the Middle Silurian McKenzie Formation, an eastern equivalent of the Lockport Dolomite. No shows were reported, and the well was not stimulated. The closest previously drilled well was the #1 Ennist, also drilled by Ridge Creek, originally completed as a dry hole in 1953. The well was redrilled and deepened in 1963 to 4,139 feet in the Middle Silurian Wills Creek Formation, but was abandoned when the rig caught fire.

CNG Development completed an ultra-deep well in Sullivan County, north-central Pennsylvania, as a dry hole in the Lower Ordovician Beekmantown Group. Although Sullivan County is technically situated on the Appalachian Plateau, the deep subsurface structures have closer affinities with the Ridge and Valley Province; hence, it is considered an "Eastern Overthrust Belt" well. CNG Development's first attempt at drilling the well ended at 280 feet, when they decided to move the hole about 200 feet northwest. The second hole was drilled to

17,581 feet, reportedly in search of the type of fracture porosity that occurred in the Upper Ordovician Bald Eagle Formation in the Grugan field, Clinton County, in 1985. Despite the report of similar structures seen in seismic surveys, the CNG well apparently did not exhibit anything remotely resembling the Grugan porosity trends, and the well was plugged and abandoned soon after drilling.

A second well in the Mesozoic Newark basin was reported in Pennsylvania in 1988 by North Central Oil Corporation. This well, the #1 Joseph A. Parestis, was drilled in Montgomery County near Philadelphia, but the well is currently a "tight hole." A "tight hole" is a well that was drilled for oil or gas but that, for reasons of confidentiality, is not reported to the Commonwealth in the standard way. This well was reported to the Commonwealth using only a standard plugging certificate. "Tight holes" are not authorized by Act 223, the oil and gas law, and all completed wells must be reported using a regulation drilling or well-completion form. The #1 Parestis well was drilled more than 5,000 feet deep and resulted in a dry hole. No other information is presently available.

GEOPHYSICAL ACTIVITY IN PENNSYLVANIA

The seismograph is the principal nondrilling exploratory tool used in Pennsylvania for the exploration of oil and gas. Although one or more companies may explore for oil and gas in any given year by using aeromagnetic and gravity sensing devices, these techniques are not considered particularly useful in Pennsylvania. The use of seismic tools is advantageous in that it can give fair to excellent indications of the attitude of rocks (whether they are folded, faulted, tilted, or flat lying) and the depth of potential hydrocarbon reservoirs by measuring the travel time for vibrations generated at the surface to reach the rock. Mechanically generated seismic pulses, especially Vibroseis, and explosive techniques, principally dynamite, are the most widely used in Pennsylvania. Seismic work is typically performed by contracted crews, and the intensity of activity is measured in crew-months.

Seismic activity in Pennsylvania increased in 1988, up 20 percent to 9 crew-months from the 7.5 crew-months reported in 1987. Activity reportedly involved about 70 percent dynamite and 30 percent Vibroseis. Oil and gas companies and service organizations engaged in seismic activity in Pennsylvania in 1988 included CNG Development, Columbia Natural Resources, ESI Geophysical, Fron-

tier Oil, Grant-Norpac, Texaco, and Western Geophysical. These companies spent \$200,000 running surveys in Cambria, Cameron, Clearfield, Clinton, Fayette, Indiana, Lycoming, and Somerset Counties.

ACTIVITIES ON STATE FOREST AND PARK LANDS

Total income from oil and gas activities on Pennsylvania State Forest and Park lands during 1988 amounted to \$3,977,303.03. This income was produced from rentals, including bonuses from lease sales, royalties, gas storage rentals, pipeline and compressor station rentals, and seismic surveys. Royalty payments for the year amounted to \$1,801,878.47 for 6,266,322 Mcf of gas produced on State land or unitized acreage. Rentals for existing exploratory acreage and past leasing programs totaled \$1,165,176.61, and gas storage rentals totaled \$988,361.95. Other income for seismic surveys and for pipeline and compressor station rentals totaled \$21,886.00.

During the year 37,901 acres of State Forest and Park lands was offered for bid for oil and gas exploration in 15 tracts. Of this total, 7 tracts comprising 13,780 acres were successfully bid and placed under lease in 1988.

At the end of 1988, a total of 523,960 acres of State Forest and Park lands was under lease for oil and gas exploration and development. In addition, the state has another 104,247 acres under lease for gas storage located in 11 different gas storage fields. Of this total, 3,562 acres, located in the North Summit gas pool in Fayette County, was placed under lease during the year.

REPORTS PUBLISHED IN 1988, OIL AND GAS GEOLOGY DIVISION GEOLOGY OF THE OIL AND GAS FIELDS OF SOUTHWESTERN PENNSYLVANIA

by John A. Harper and
Christopher D. Laughrey

The Pennsylvania Geological Survey published a report in 1988 that contains valuable information on the geology and production history of the oil and gas fields of southwestern Pennsylvania. The report covers that portion of Pennsylvania south of the Ohio River and west of the Monongahela River, that is, all of Greene and Washington Counties and the southern halves of Beaver and Allegheny Counties (Figure 32). This part of the state has had a rich

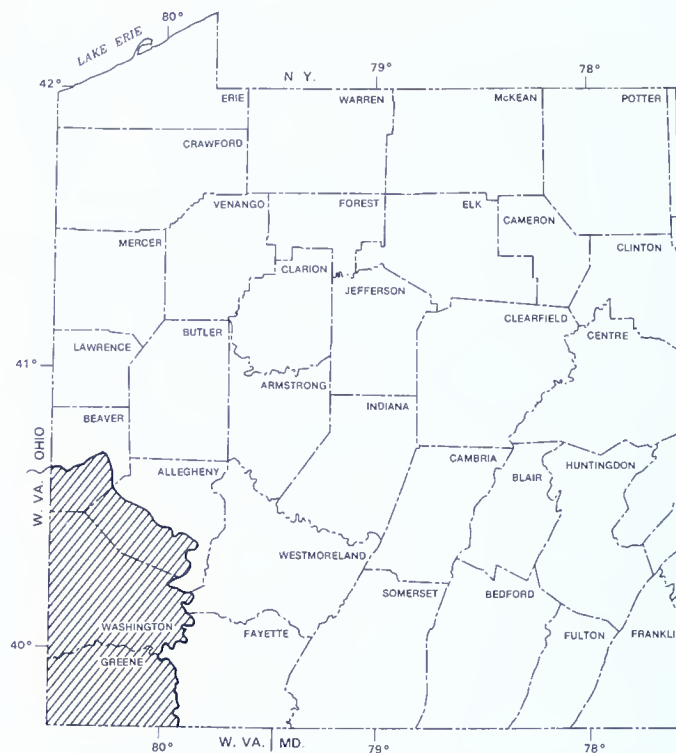


Figure 32. Area covered by the report *Geology of the Oil and Gas Fields of Southwestern Pennsylvania*.

and interesting heritage of oil and gas exploration and development during the past 100 years. For example, in 1892 crude oil production in the area amounted to 13,403,724 barrels, or 49 percent of the total state production that year. Declining production of both oil and gas, and competition with the coal-mining industry for leasing of land, has slowed exploration and drilling in more recent years. Despite this, some of the oil and gas fields of southwestern Pennsylvania have relatively high estimated reserves because of early abandonment. Recent reserve estimates for the area are low because few new discoveries have been made since the early 1900's. Realistically, the low estimates of oil and gas reserves are probably due more to a lack of new information than to declining reserves. Mineral Resource Report 87, *Geology of the Oil and Gas Fields of Southwestern Pennsylvania* was published by the Survey in order to help stimulate interest in the area. The well-illustrated report contains information on the stratigraphy, petrology, source beds, thermal history, structure, and drilling and production history of southwestern Pennsylvania. Both conventional and unconventional hydrocarbon resources are discussed, and the authors conclude that there is still a great deal of potential for recovery of oil and gas in this traditionally ignored area.

More information on Mineral Resource Report 87, including cost and ordering instructions, as well as a list of previously published reports on oil and

gas, can be obtained by contacting the Pennsylvania Geological Survey, Oil and Gas Geology Division, 121 South Highland Avenue, Pittsburgh, PA 15206-3988, telephone 412-645-7057.

PROJECTS IN PROGRESS IN 1988, OIL AND GAS GEOLOGY DIVISION

OIL AND GAS BASE MAPS

The Oil and Gas Geology Division continues to make available to the public a series of 7.5-minute oil and gas base maps. The series covers all of western Pennsylvania's oil and gas fields and the areas of central and eastern Pennsylvania where exploratory drilling has occurred. The series is accessible as ozalid ("blueline") reproductions of standard U.S. Geological Survey 7.5-minute topographic maps overprinted with well symbols and identifying numbers. The topographic portion of each map is subdued so that the well information stands out, but is still legible on a blueline reproduction. New well information is added periodically during updating of the map series.

Details for purchasing base maps can be obtained by contacting the Pennsylvania Geological Survey, Oil and Gas Geology Division, 121 South Highland Avenue, Pittsburgh, PA 15206-3988, telephone 412-645-7057. When requesting copies of the maps, please provide the 7.5-minute topographic map name of each map desired. Figure 33 shows those parts of Pennsylvania for which base-map coverage is available.

GEOCHEMISTRY OF PETROLEUM SOURCE ROCKS IN PENNSYLVANIA

by Christopher D. Laughrey

The Oil and Gas Geology Division continued work on the reconnaissance geochemical study of petroleum source rocks initiated in 1987. The project is scheduled for completion in 1989. In the study, petroleum source rocks in Pennsylvania will be identified and correlated to hydrocarbon reservoirs through determinations of organic content, kerogen types, stable isotope chemistry, and compositions of solvent-extractable hydrocarbons and nonhydrocarbons. Thermal maturities will be determined from optical and physicochemical properties of kerogens and by mathematical modeling. This regional geochemical study should prove useful in determining the patterns of hydrocarbon generation and migration within exploration and development areas in Pennsylvania. Such data are critical to the

future development of petroleum reservoirs in the state's mature fields, and to the discovery of new fields in unexplored parts of Pennsylvania.

PRELIMINARY FEASIBILITY STUDY OF THE COAL-BED METHANE RESOURCE IN PENNSYLVANIA

by Antonette K. Markowski

In 1988 the Oil and Gas Geology Division continued a preliminary study of the feasibility of producing natural gas from Pennsylvanian coals in the western half of the state. This study was initiated in 1987 and is scheduled for completion in 1989. The general objectives of the study are to identify the potential for coal-bed methane production and, assuming that this potential is high, to (1) identify key areas having high methane content; (2) identify possible trends of high methane content; (3) correlate methane content within various coal seams by rank, thickness, and burial depth; and (4) assess the geologic implications of coal-bed methane as a supplemental and/or alternative energy source. Only minor work has been conducted on this little-known but valuable natural resource in Pennsylvania. Because of the growing interest nationwide in the degasification of deep-lying coals having high methane content, however, this project should provide useful information on coal-bed methane on a regional basis. The final report should prove interesting to the coal-mining industry, the oil and gas industry, academic and industrial customers using cogeneration power plants, and the general public.

OPEN-FILE REPORTS AND OTHER DATA AVAILABLE

The following reports and other data are available on open file at the Pennsylvania Geological Survey, Oil and Gas Geology Division, 7th Floor Highland Building, 121 South Highland Avenue, Pittsburgh, PA 15206-3988.

*Open-file
report no.*

- 1 *Surface to Middle Devonian (Onondagan) Stratigraphy, Part I (STOMDES), 1972, by D. R. Kelley and W. R. Wagner, 15 p., 8 cross sections, vertical scale 1 inch = 100 feet.*
- 2 *Deep Sand Exploration and Gas Developments in Pennsylvania, 1989, by L. J. Balogh, 2 map sheets, scale 1:250,000.*



Figure 33. Index maps of available (shaded) 7.5-minute oil and gas base maps.

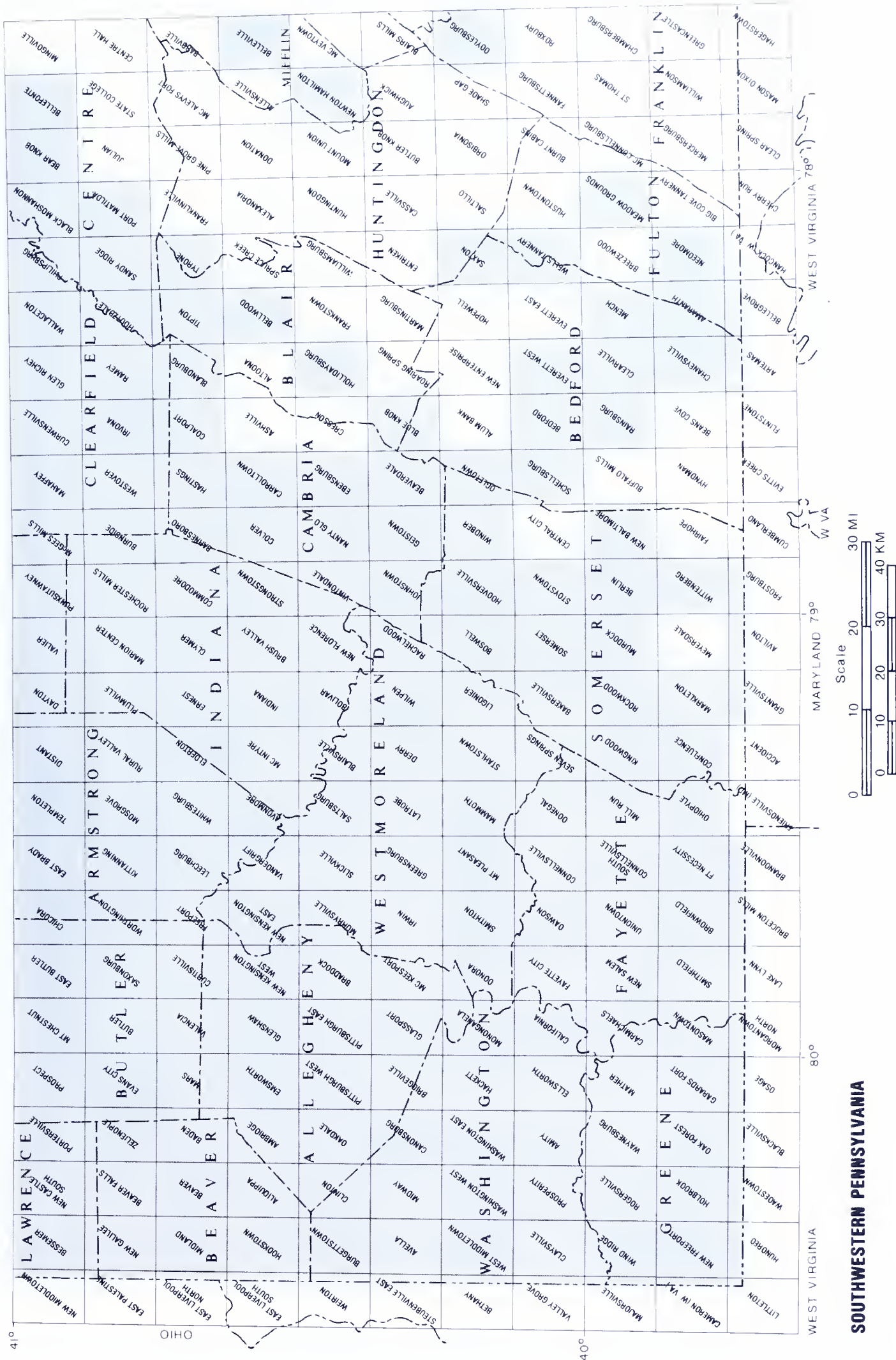


Figure 33. (Continued).



Figure 33. (Continued).

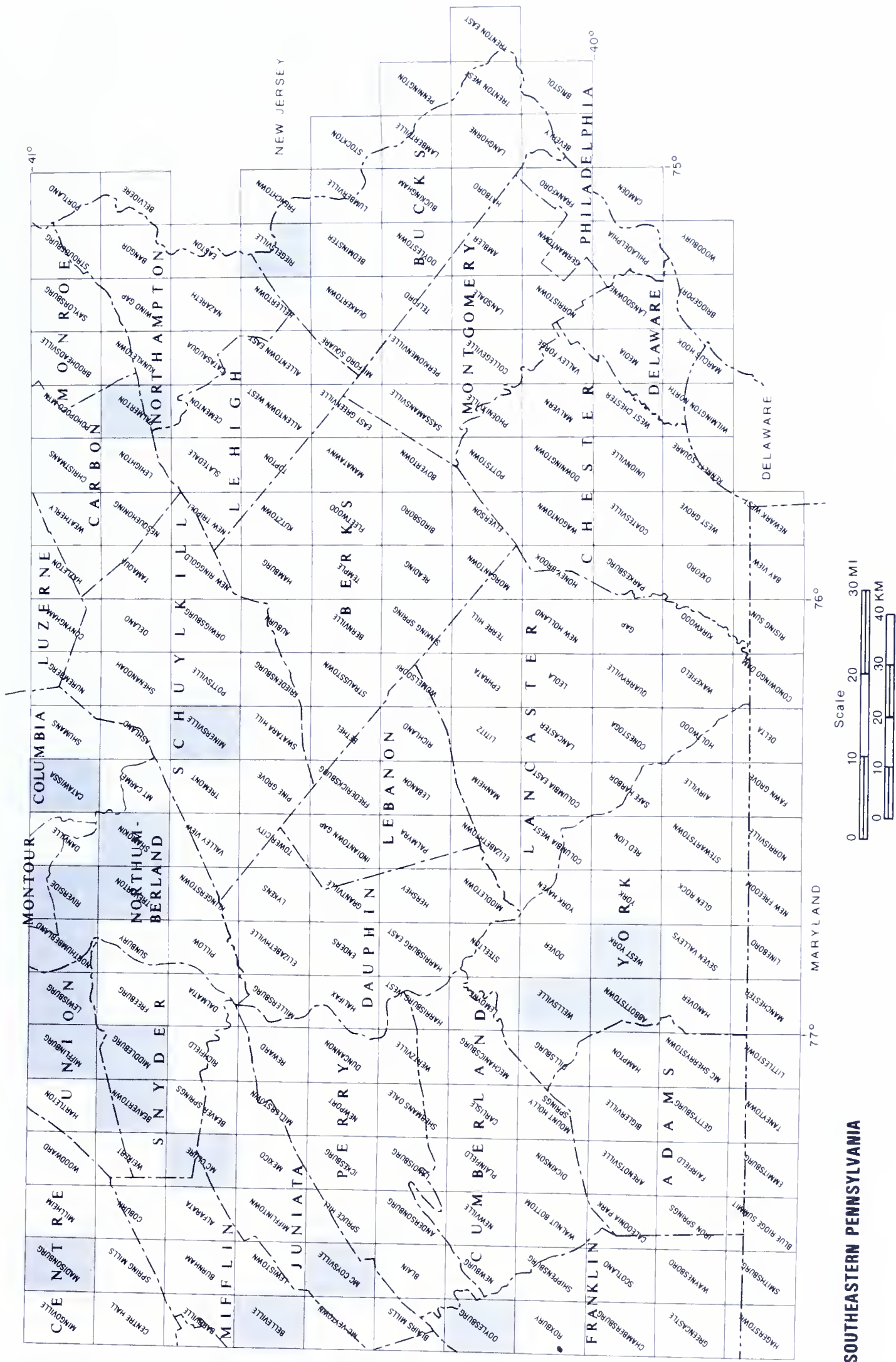


Figure 33. (Continued).

*Open-file
report no.*

- 3 *Salina or Equivalent and Deeper Penetrations of Pennsylvania*, 1973, by D. R. Kelley and L. J. Balogh, 1 map, scale 1:500,000 (last updated in 1979).
- 4 *Tully and Deeper Formations, Brine Analysis of Pennsylvania*, 1973, by D. R. Kelley, L. A. Heeren, and others, 1 chart and map, scale 1:500,000.
- 5 *Stratigraphic Framework of the Greater Pittsburgh Area, Parts I and II*, 1972, by W. R. Wagner and W. S. Lytle, 20 p., 9 sections in 13 sheets.
- 6 *Active Gas Storage Areas Map of Pennsylvania*, 1981, by L. J. Balogh, 1 map, scale 1:500,000 (updated as needed).
- 7 *Subsurface Rock Correlation Diagram, Allegheny Plateau, Pennsylvania*, 1979, by J. A. Harper, 1 sheet.

There are also over 100,000 drillers' records and logs, along with approximately 8,500 geophysical logs, on open file at the Pennsylvania Geological Survey's Pittsburgh office. Approximately 44,000 of the 100,000 records on file consist of well-data cards compiled by the U.S. Geological Survey and the Pennsylvania Geological Survey between 1900 and 1970 as the bases for topographic-map quadrangle reports. In addition, the Survey has a sample library containing drill cuttings from approximately 1,200 wells, and a core storage library containing cores from 48 wells, including the five wells cored under the U.S. Department of Energy's Eastern Gas Shales Program. All cuttings and cores are available for inspection and study.

SUMMARIZED RECORDS OF REPORTED DEEP WELLS¹ IN 1988

by Christopher D. Laughrey,
Cheryl L. Cozart, and Rebecca A. Kilbert

The information shown in Figure 35 was compiled mainly from drillers' logs, location plats, and geophysical logs received from the Bureau of Oil

Figure 34. *Types of geophysical logs and abbreviations.*

Caliper	CAL
Cement bond log	CBL
Continuous directional	CDR
Compensated density log	CDL
Compensated neutron log	CNL
Dipmeter	DIP
Dual laterolog	DLL
Dual induction log	DIL
Electromagnetic propagation	EPT
Fracture identification log	FIL
Gamma ray	GR
Gamma-ray spectralog	GRSPECTAL
Guard	GD
Induction log	IL
Computer interpretative	INT
Laterolog	LL
Merge	MERGE
Microspherically focused log	MSFL
Perforating collar log	PCL
Sibilation	S
Sonic	SON
Temperature	T
3-D velocity	3-D VEL
Radioactive tracer	TRACER
Sidewall neutron porosity	SNP
Variable density log	VDL

and Gas Management, as well as personal communication with oil and gas operators. Well records are filed with the Bureau of Oil and Gas Management by permit numbers. The Oil and Gas Geology Division, Pennsylvania Geological Survey, files the records in order by county, 7.5-minute topographic map, and permit number.

Most of the formation tops and total depths recorded in Figure 35 were picked from geophysical logs of many varieties (see Figure 34 for lists of these logs and their abbreviations). The logs received for a particular well are listed in Figure 35 along with the logged interval. Lack of this information indicates that no geophysical logs were received and that formation picks are taken directly from the drillers' logs. The tables are listed alphabetically by county and numerically by permit number.

¹Wells that penetrate rocks of Middle Devonian or older age.

Figure 35. Summarized records of reported deep wells in 1988 that penetrated rocks of Middle Devonian or older age.

COUNTY Permit Number	Butler 019-21305	Butler 019-21313-P	Cameron 023-20073-P	Centre 027-20196-P	Clearfield 033-22695	Clearfield 033-23022	Clearfield 033-23096	Crawford 039-20674	Crawford 039-20675	Crawford 039-21599
NAME OF WELL	Clarence Creel #1	Samuel Sherman #1	Keystone Manor #1	R. & L. Stiver #1	Irwin Heirs #1	Parker Dam Unit #1	Francis Kassab Unit #1	V. Adams #1	V. Adams #2	W. Mihalak #1
OPERATOR	Wilmoth Interests, Incorporated	Cabot Oil & Gas Corporation	CMG Development Corp. #2956	Eastern States Exploration Company	Fox Oil & Gas, Inc. #332	Equitable Resources Exp. #959	Fairman Drilling Company #F-4730	M. & W. Energy Company #01	M. & W. Energy Company #02	Atlas Resources, Inc.
TOWNSHIP	Clay	Marion	Shippen	Worth	Pike	Huston	Bradford	Beaver	Beaver	Spring
QUADRANGLE	Mount Chestnut	Barkeyville	West Creek	Port Matilda	Elliot Park	Huntley	Wallacetown	Beaver Center	Beaver Center	Conneautville
LATITUDE	13,240 ft. S 41°00'00"	7,280 ft. S 41°10'00"	5,550 ft. S 41°30'00"	3,500 ft. S 40°50'00"	7,350 ft. S 41°02'30"	1,000 ft. S 41°12'30"	1,100 ft. S 41°00'00"	9,820 ft. S 41°52'30"	13,200 ft. S 41°52'30"	9,700 ft. S 41°52'30"
LONGITUDE	1,940 ft. W 79°57'30"	1,430 ft. W 79°57'30"	9,250 ft. W 78°15'00"	2,950 ft. W 78°02'30"	1,600 ft. W 78°32'30"	9,300 ft. W 78°27'30"	6,025 ft. W 78°17'30"	10,260 ft. W 80°27'30"	9,900 ft. W 80°27'30"	6,150 ft. W 80°15'00"
DATE COMPLETED	9-28-87	6-7-88	12-9-87	10-24-87	6-17-87	3-16-88	8-23-88	6-16-80	5-16-80	4-18-82
ELEVATION	1260 GR	1437 GR	1901 GR	1070 GR	1980 GR	1735 GR	1660 GR	970 GR	980 GR	1130 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/GR: 0-5793 OIL/GR: 3000-5573 CNL/T/GR: 3200-5728									CDL/CNL: 224-3780 GR/LL: 224-3779 INT: 2490-3762 PCL: 3450-3738
TULLY LIMESTONE	5210-	4615-		1220-	6665-	6193-	6881-	1904-	1974-	2112-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	5446-	4841-			7455-	6883-	7771-	2126-	2125-	2310-
ORISKANY SANDSTONE RIDGELEY SANDSTONE		4959-		3480-	7513-	6947-	7819-	2260-	2322-	2558-
SILURIAN-DEVONIAN CARBONATES	5630-	4978-	6060-		7516-	6962-	7832-	2314-	2384-	2566-
SALINA GROUP LOCKPORT DOLOMITE		5353- 6005-						2545- 2940-	2602- 2988-	2642- 3250-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		6381- 6473-						3232-	3232-	3506- 3554-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE		6583- 6739- 6755-						3350-	3348-	3591- 3772- 3754-
QUEENSTON FORMATION		6775-						3530-	3530-	3760-
PRODUCING FORMATION	Tully Marcellus				Bradford	Ridgeley		Medina	Medina	Medina
PRODUCING INTERVAL	5134-5552				1868-2702	6948-6955		3364-3525	3319-3412	3614-3704
TOTAL DEPTH	5822	6954	6060	3762	7580	7163	7884	3570	3570	3784
DEEPEST FORMATION REACHED	Queenston	Queenston	Heiderberg	Heiderberg	Heiderberg	Heiderberg	Heiderberg	Queenston	Queenston	Queenston
RESULTS	60 Mcf AF 1650 psi/476 hrs. Deeper pool test Creel pool Queen Junction field	250 Mcf AF 900 psi/48 hrs. Plugged and abandoned Deeper pool test Branchton field	18 Mcf AF 2,360 psi/480 hrs. Plugged and abandoned unnamed New field wildcat	Plugged and abandoned Shallow pool test Black Moshannon field	Dry deep Producing shallow 450 Mcf AF 800 psi/72 hrs. development Graupman field	2,318 Mcf AF 560 psi/24 hrs. New pool wildcat Parker Dam pool Punxsutawney- Oriftwood field	Unsuccessful new field wildcat	150 Mcf AF 1,120 psi/48 hrs. extension Mud Run pool Conneaut field	50 Mcf AF 1,120 psi/48 hrs. extension Mud Run pool Conneaut field	485 Mcf AF 1,100 psi/48 hrs. development Pageville pool Conneaut field

Figure 35. (Continued).

COUNTY Permit Number	Crawford 039-21600	Crawford 039-21853	Crawford 039-21911	Crawford 039-21912	Crawford 039-22051	Crawford 039-22053	Crawford 039-22054	Crawford 039-22056	Crawford 039-22124	
NAME OF WELL	Jeffrey Benlisa #1	Spartwood #1	H. B. Simmons #2	H. B. Simmons #1	Morris #1	Lee Verne Port #1	Birchard-Onachy #1	Donald Bridger #1	Theodore J. Hecker #1	
OPERATOR	Atlas Resources, Inc.	Ingram Enterprises, Inc.	Ingram Enterprises, Inc.	Ingram Enterprises, Inc.	Meadville Forging Company	C & C Troyer Brothers #93	C & C Troyer Brothers #92	C & C Troyer Brothers #95	Mitchell Energy Corporation	
TOWNSHIP	Spring	Rome	Athens	Athens	West Head	Rockdale	Rockdale	Cambridge	Cussewago	
QUADRANGLE	Conneautville	Spartansburg	Millers Station	Millers Station	Meadville	Millers Station	Millers Station	Cambridge Springs	Edinboro South	
LATITUDE	8,110 ft. S 41°50'00"	11,700 ft. S 41°47'30"	8,780 ft. S 41°47'30"	9,000 ft. S 41°47'30"	900 ft. S 41°40'00"	5,400 ft. S 41°50'00"	4,200 ft. S 41°50'00"	11,550 ft. S 41°52'30"	6,275 ft. S 41°50'00"	
LONGITUDE	8,450 ft. W 80°15'00"	5,690 ft. W 79°40'00"	7,450 ft. W 79°52'30"	8,920 ft. W 79°52'30"	1,250 ft. W 80°10'00"	7,000 ft. W 79°57'30"	7,300 ft. W 79°57'30"	3,300 ft. W 80°02'30"	10,710 ft. W 80°10'00"	
DATE COMPLETED	5-11-82	10-29-82	12-3-82	11-23-82	10-19-83	10-24-83	10-21-83	11-16-83	6-13-84	
ELEVATION	1290 GR	1660 GR	1350 GR	1300 GR	1080 GR	1150 GR	1150 GR	1180 GR	1304 GR	
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 0-3198 GR/LL: 1600-4045 INT: 2600-4000 PCL: 3700-3986	GR/COL: 400-5276	GR/COL: 2900-4652	GR/COL: 2800-4602		PCL: 3850-4180	PCL: 3966-4046	PCL: 3850-4138	COL/CNL/GR: 2420-4038 OLL/GR: 2420-4010 SON: 0-4010 GR/TRACER: 2092-4076	
TULLY LIMESTONE	2378-	3546-	2918-	2848-	2610-	2494-	2494-	2420-	2438-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2561-	3794-	3148-	3072-	2790-	2700-	2710-	2634-	2638-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE	2762-	3946-	3336-							
SILURIAN-DEVONIAN CARBONATES	2767-	3962-	3348-	3254-	3050-	3000-	3080-	2870-	2850-	
SALINA GROUP LOCKPORT DOLOMITE	2834- 3464-	4010- 4633-	3397- 4044-	3318- 3944-	3220- 3740-	3280-		3236-	2910- 3514-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3720- 3770-	4920- 4960-	4293- 4352-	4217- 4276-	3850- 3892-	3850- 3892-	3892-	3856-	3782- 3835-	
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3806- 3896- 3976-	5034- 5138- 5189-	4400- 4527- 4561-	4320- 4423- 4483-	4134-	3934- 4056- 4098-	3927- 4052- 4092-	3880- 4015- 4058-	3870- 3972-	
QUEENSTON FORMATION	3981-	5208-	4574-	4494-	4336-	4108-	4104-	4070-		
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	
PRODUCING INTERVAL	3861-3982	5092-5152	4440-4568	4349-4490	4213-4264	3973-4038	3966-4046	3929-3978	3892-4046	
TOTAL DEPTH	4071	5292	4657	4602	4421	4180	4221	4190	4174	
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	
RESULTS	2,000 Mcf AF 1,025 psi/48 hrs. development Indian Springs pool Conneaut field	350 Mcf Nat. 1,125 psi/72 hrs. development Rome Athens field	300 Mcf Nat. 1,175 psi/72 hrs. development Brown Hill pool Eaton Corners field	200 Mcf Nat. 1,150 psi/72 hrs. development Brown Hill pool Eaton Corners field	460 Mcf Nat. 500 psi/72 hrs. extension Blooming Valley field	350 Mcf AF 1,280 psi/72 hrs. development West Head Conneaut field	2,500 Mcf AF 1,275 psi/48 hrs. development Rockdale field	3,000 Mcf AF 1,275 psi/120 hrs. development Rockdale field	500 Mcf AF 1,240 psi/48 hrs. development Cambridge Springs field	48 Mcf AF 1,140 psi/162 hrs. development Cussewago field

COUNTY Permit Number	Crawford 039-22134	Crawford 039-22136	Crawford 039-22139	Crawford 039-22146	Crawford 039-22151	Crawford 039-22152	Crawford 039-22154	Crawford 039-22167	Crawford 039-22170	Crawford 039-22176
NAME OF WELL	Charles LeOoux #1	Alfred Mailliard #1	Robert Peterson #1	Hary Kulik #2	Louis Long #1	Geza Pap #1	Oavid Ounn #4	Paul Fullerton #1	Raymond Kasbee #1	L. Wright #2
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Northwest Natural Gas Company	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cosimo & Geraldine Dechiplinti
TOWNSHIP	Fairfield	Fairfield	Fairfield	Spring	Fairfield	Fairfield	Fairfield	Fairfield	Fairfield	Woodcock
QUADRANGLE	New Lebanon	Cochranon	Cochranon	Conneautville	Cochranon	Cochranon	Cochranon	Cochranon	New Lebanon	Headville
LATITUDE	2,600 ft. S 41°30'00"	8,900 ft. S 41°32'30"	12,600 ft. S 41°32'30"	10,350 ft. S 41°32'30"	11,300 ft. S 41°32'30"	10,900 ft. S 41°32'30"	7,400 ft. S 41°32'30"	5,240 ft. S 41°32'30"	330 ft. S 41°30'00"	2,850 ft. S 41°42'30"
LONGITUDE	8,500 ft. W 80°05'00"	10,100 ft. W 80°05'00"	11,200 ft. W 80°02'30"	9,500 ft. W 80°17'30"	2,000 ft. W 80°05'00"	10,200 ft. W 80°02'30"	6,000 ft. W 80°05'00"	4,400 ft. W 80°05'00"	4,820 ft. W 80°02'30"	2,100 ft. W 80°07'30"
DATE COMPLETED	6-20-84	6-20-84	4-28-84	2-15-85	6-1-84	5-12-84	6-15-84	9-11-84	5-19-84	5-25-84
ELEVATION	1423 GR	1224 GR	1404 GR	1140 GR	1460 GR	1425 GR	1240 GR	1218 GR	1385 GR	1233 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/COL: 0-5355	GR/COL: 0-5077	GR/COL: 0-5347	GR/CNL: 2050-3731	GR/COL: 0-5365	GR/COL: 0-5352	COL: 0-5106	LL: 554-5075 COL: 554-5076	GR/COL: 0-5369	COL/CNL: 766-4484 GR/LL: 2480-4484 INT: 3090-4440 PCL: 4285-4341
TULLY LIMESTONE	3458-	3226-	3470-	2125-	3504-	3478-	3250-	3228-	3496-	2706-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3646-	3413-	3668-	2312-	3700-	3674-	3446-	3424-	3700-	2900-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3818-	3590-	3837-	2460-	3868-	3842-	3618-	3600-	3864-	3106-
SILURIAN-DEVONIAN CARBONATES	3836-	3608-	3857-	2568-	3890-	3864-	3640-	3620-	3884-	3130-
SALINA GROUP LOCKPORT DOLOMITE	3930- 4704-	3596- 4444-	3954- 4710-	2643- 3263-	4400- 4702-	3958- 4680-	3726- 4464-	3710- 4430-	3986- 4686-	3180- 3878-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4988- 5018-	4716- 4773-	4986- 5044-	3452- 3520-	5016- 5078-	4924- 5054-	4738- 4796-	4720- 4776-	5008- 5072-	4148- 4206-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	5112- 5226- 5294-	4828- 4974- 5010-	5108- 5248- 5286-	3554- 3640- 3722-	5136- 5278- 5312-	5116- 5268- 5292-	4854- 5008- 5034-	4832- 4940- 5010-	5136- 5274- 5312-	4248- 4389- 4420-
QUEENSTON FORMATION	5306-	5028-	5300-	3730-	5328-	5306-	5052-	5030-	5322-	4431-
PRODUCING FORMATION	Hedina	Hedina	Hedina	Hedina	Hedina	Hedina	Hedina	Hedina	Hedina	Hedina
PRODUCING INTERVAL	5130-5223	4870-4969	5150-5243	3582-3638	5172-5271	5163-5229	4907-5005	4840-4943	5162-5271	4285-4341
TOTAL DEPTH	5357	5092	5365	3732	5409	5360	5119	5080	5381	4486
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,980 Mcf AF 1,125 psi/48 hrs. development Kantz Corners field	1,430 Mcf AF 1,337 psi/48 hrs. development Kantz Corners field	1,400 Mcf AF 1,340 psi/60 hrs. development Kantz Corners field	1,200 Mcf AF 980 psi/48 hrs. development Lundys Lane pool Conneaut field	2,340 Mcf AF 1,288 psi/48 hrs. development Kantz Corners field	1,700 Mcf AF 1,130 psi/60 hrs. development Kantz Corners field	1,130 Mcf AF 1,130 psi/60 hrs. development Kantz Corners field	200 Mcf AF 1,360 psi/48 hrs. development Kantz Corners field	200 Mcf AF 1,120 psi/48 hrs. development Cochranon field	1,000 Mcf AF 1,350 psi/72 hrs. development Kastle pool Conneaut field

Figure 35. (Continued).

COUNTY Permit Number	Crawford 039-22179	Crawford 039-22194	Crawford 039-22196	Crawford 039-22197	Crawford 039-22200	Crawford 039-22208	Crawford 039-22241	Crawford 039-22245	Crawford 039-22247	Crawford 039-22260
NAME OF WELL	J. R. Greenawalt #1	Joseph Hegyi #1	N. J. Whitaker #1	Paul Kennedy #1	Frank Laush #2	F. Fischer #1	R. Greenawalt #1	Gulanen/Augustyniak #1	George & Martha Hanna #1	Carroll's Nursery #3
OPERATOR	Cosimo & Geraldine Dechipinti	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cosimo & Geraldine Dechipinti	Northwest Natural Gas Company	Mitchell Energy Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Conneaut	Fairfield	Fairfield	Fairfield	Fairfield	Fairfield	Conneaut	Spring	East Fallowfield	Wayne
QUADRANGLE	Linesville	Cochranston	New Lebanon	New Lebanon	Cochranston	Cochranston	Linesville	Conneautville	Conneaut Lake	New Lebanon
LATITUDE	6,600 ft. S 41°42'30"	13,800 ft. S 41°42'30"	700 ft. S 41°30'00"	780 ft. S 41°30'00"	13,900 ft. S 41°32'30"	9,350 ft. S 41°32'30"	1,300 ft. S 41°42'30"	4,450 ft. S 41°50'00"	4,630 ft. S 41°32'30"	1,700 ft. S 41°30'00"
LONGITUDE	9,700 ft. W 80°22'30"	2,800 ft. W 80°05'00"	700 ft. W 80°05'00"	3,700 ft. W 80°05'00"	8,500 ft. W 80°02'30"	3,500 ft. W 80°02'30"	780 ft. W 80°25'00"	3,100 ft. W 80°20'00"	4,470 ft. W 80°20'00"	1,800 ft. W 80°00'00"
DATE COMPLETED	6-4-84	5-12-84	9-20-84	9-22-84	9-13-84	9-9-84	12-12-84	3-3-85	8-21-84	10-5-84
ELEVATION	1190 GR	1432 GR	1403 GR	1432 GR	1323 GR	1048 GR	1173 GR	1160 GR	1046 GR	1316 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 2231-4232 GR/LL: 2229-4229 INT: 2790-4045	GR/COL: 0-5187 DLL: 2070-4182	COL: 0-5371	GR/COL: 0-5386	GR/COL: 0-5309	GR/COL: 0-5018		GR/CNL: 2150-3819	GR/CBL: 4200-4533	PCL: 5050-5375
TULLY LIMESTONE	2446-		3488-	3498-	3410-	3128-	2246-	2214-		
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2596-	3686-	3684-	3688-	3610-	3334-	2473-	2392-		
ORISKANY SANDSTONE RIDGELEY SANDSTONE	2801-	3854-	3850-	3858-	3776-	3500-				
SILURIAN-DEVONIAN CARBONATES	2808-	3876-	3870-	3880-	3794-	3518-	2679-	2628-		
SALINA GROUP LOCKPORT DOLOMITE	2888- 3574-	3968- 4736-	3968- 4744-	3974- 4750-	3894- 4662-	3600- 4370-	3020- 3470-	2698- 3288-		
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3830- 3900-	5006- 5064-	5016- 5069-	5018- 5068-	4940- 4994-	4646- 4708-		3538- 3594-	4210- 4266-	5092-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3840- 4136- 4116-	5128-	5138- 5286- 5318-	5140- 5266- 5318-	5058- 5200- 5234-	4752- 4905- 4942-	3825- 3926- 3977-	3631- 3724- 3804-	4316- 4422- 4498-	5150- 5298- 5332-
QUEENSTON FORMATION	4124-		5332-	5332-	5244-	4954-	4010-	3806-	4510-	5344-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3976-4034	5168-5256	5142-5226	5140-5242	5064-5193	4776-4866	3879-3909	3655-3722	4348-4508	5152-5251
TOTAL DEPTH	4234	5370	5406	5400	5309	5018	4150	3822	4580	5370
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	600 Mcf AF 1,350 psi/72 hrs. development Carlson Conneaut field	900 Mcf AF 1,200 psi/48 hrs. development Kantz Corners field	410 Mcf AF 1,325 psi/48 hrs. development Kantz Corners field	200 Mcf AF 1,340 psi/48 hrs. development Kantz Corners field	470 Mcf AF 1,275 psi/48 hrs. development Kantz Corners field	716 Mcf AF 1,100 psi/48 hrs. development Cochranston field	650 Mcf AF 950 psi/72 hrs. development Carlson Conneaut field	1,200 Mcf AF 1,050 psi/48 hrs. development Lundys Lane pool Conneaut field	354 Mcf AF 1,250 psi/168 hrs. extension Adamsville pool Atlantic field	416 Mcf AF 1,290 psi/48 hrs. development Cochranston field

COUNTY Permit Number	Crawford 039-22264	Crawford 039-22274	Crawford 039-22282	Crawford 039-22286	Crawford 039-22523	Crawford 039-22546	Crawford 039-22625	Crawford 039-22679	Crawford 039-22680	Crawford 039-22681
NAME OF WELL	V. Rung #3	Carroll's Nursery #4	Mary Kellyman #2	J. Ankenbauer #2	Recland Co. #4	Recland Co. #3	Daniel L. Healy #1	George Hasbrouck #1	Daniel S. McCombs #1	Mildred R. Merry #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Peter C. Flanigan & Associates	Buckaloon Energy, Inc.	Buckaloon Energy, Inc.	Buckaloon Energy, Inc.	Kenco Oil & Gas, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.
TOWNSHIP	Fairfield	Wayne	Cussewago	Conneaut	Conneaut	Conneaut	Rockdale	Rome	Rome	Rome
QUADRANGLE	Geneva	New Lebanon	Edinboro South	Linesville	Linesville	Linesville	Millers Station	Titusville North	Titusville North	Spartansburg
LATITUDE	9,690 ft. S 41°32'30"	1,350 ft. S 41°30'00"	10,720 ft. S 41°47'30"	11,775 ft. S 41°45'00"	11,850 ft. S 41°45'00"	11,800 ft. S 41°45'00"	13,710 ft. S 41°52'30"	13,830 ft. S 41°45'00"	4,700 ft. S 41°45'00"	12,380 ft. S 41°47'30"
LONGITUDE	5,170 ft. W 80°07'30"	210 ft. W 80°00'00"	10,700 ft. W 80°12'30"	7,560 ft. W 80°22'30"	2,000 ft. W 80°25'00"	3,350 ft. W 80°25'00"	5,880 ft. W 79°57'30"	7,550 ft. W 79°37'30"	7,800 ft. W 79°42'30"	4,370 ft. W 79°37'30"
DATE COMPLETED	10-4-84	12-7-84	10-26-88	11-11-84	11-4-85	10-28-85	11-6-86	1-22-86	1-30-86	4-1-86
ELEVATION	1323 GR	1515 GR	1130 GR	1165 GR	1150 GR	1180 GR	1190 GR	1615 GR	1422 GR	1753 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR/COL: 0-5134	COL: 608-5532						COL/CNL: 3550-5383 GO: 3550-5383 LMT: 3550-5383	COL/CNL: 3200-5029	COL/CNL: 3600-5443 GO: 3600-5443
TULLY LIMESTONE	3318-	3620-		2360-	2267-	2296-	2512-	3640-	3264-	3642-
ONONDAGA LIMESTONE MUNTERSVILLE CHERT	3498-	3840-	2543-	2520-	2493-	2518-	2735-	3900-	3504-	3900-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3678-	3984-								
SILURIAN-DEVONIAN CARBONATES	3696-	4006-	2702-	2720-	2698-	2856-		4050-	3680-	4046-
SALINA GROUP LOCKPORT DOLOMITE	3794- 4534-	4118- 4886-	2778- 2826-	2997- 3474-	2916- 3372-	2940- 3387-	3278- 3497-	4130- 4866-	3736- 4380-	4110- 4780-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4802- 4854-	5166- 5226-	3790-		3720-	3738-	3820- 3902-	5054- 5118-	4562- 4722-	5046- 5110-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	4911- 5062- 5094-	5282- 5429- 5482-	3878- 3970- 4006-	3856- 3951- 4004-	3826-	3846-	3962- 4068- 4105-	5172- 5304- 5334-	4776- 4900- 4936-	5162- 5285- 5320-
QUEENSTON FORMATION	5112-	5474-	4025-	4040-	4010-	4032-	4115-	5346-	4948-	5332-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4855-5024	5288-5374	3880-3966	3895-3947	3879-3912	3891-3936	4017-4111	5230-5344	4811-4940	5223-5331
TOTAL DEPTH	5148	5537	4060	4167	4130	4144	4229	5393	5044	5437
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	260 Mcf AF 1,310 psi/48 hrs. development Kant's Corners field	300 Mcf AF 1,450 psi/48 hrs. development Cochranon field	300 Mcf AF 1,100 psi/48 hrs. development Kastle pool Conneaut field	700 Mcf AF 1,200 psi/72 hrs. development Indian Springs pool Conneaut field	323 Mcf AF 960 psi/72 hrs. development Indian Springs pool Conneaut field	360 Mcf AF 1,110 psi/72 hrs. development Indian Springs pool Conneaut field	894 Mcf AF 1,300 psi/336 hrs. development Rockdale field	5,602 Mcf AF 1,368 psi/168 hrs. development Vrooman pool Church Run field	1,300 Mcf AF 1,593 psi/72 hrs. development Rome Athens field	963 Mcf AF 1,410 psi/72 hrs. development Hatchtown pool Church Run field

Figure 35. (Continued).

COUNTY Permit Number	Crawford 039-22682	Crawford 039-22694	Crawford 039-22698	Crawford 039-22880	Crawford 039-22881	Crawford 039-22895	Crawford 039-22900	Crawford 039-22906	Crawford 039-22908	Crawford 039-22910	
NAME OF WELL	Mark S. Russell #1	Kaiser #4	Kaiser #3	Peter Stagl #2	Katherine Rippert #5	Schweitzer #1	John W. Green, Sr. #1	Russell Hummer #2	Howard Burleigh #3	Regis Nadoiny #2	
OPERATOR	Oiasu Exploration & Production, Inc.	Ralph L. Albright Drilling Co.	Ralph L. Albright Drilling Co.	Northwest Natural Gas Company	Northwest Natural Gas Company	Oiasu Exploration & Production, Inc.	John W. Greene, Sr.	Oiasu Exploration & Production, Inc.	Oiasu Exploration & Production, Inc.	Oiasu Exploration & Production, Inc.	
TOWNSHIP	Rome	Beaver	Beaver	Spring	Spring	Rome	Spring	Rome	Rome	Rome	
QUADRANGLE	Titusville North	Pierpont	Pierpont	Conneautville	Conneautville	Grand Valley	Beaver Center	Titusville North	Grand Valley	Grand Valley	
LATITUDE	3,550 ft. S 41°42'30"	9,980 ft. S 41°52'30"	10,000 ft. S 41°52'30"	1,850 ft. S 41°50'00"	1,300 ft. S 41°50'00"	4,030 ft. S 41°42'30"	12,670 ft. S 41°50'00"	15,070 ft. S 41°45'00"	5,850 ft. S 41°45'00"	40 ft. S 41°45'00"	
LONGITUDE	6,000 ft. W 79°40'00"	2,110 ft. W 80°30'00"	4,370 ft. W 80°30'00"	6,100 ft. W 80°20'00"	8,800 ft. W 80°20'00"	10,345 ft. W 79°35'00"	4,280 ft. W 80°22'30"	6,720 ft. W 79°37'30"	10,610 ft. W 79°35'00"	10,000 ft. W 79°35'00"	
DATE COMPLETED	6-14-86	3-6-86	3-1-86	8-14-87	8-14-87	10-30-87	3-11-87	11-3-87	11-20-87	8-21-87	
ELEVATION	1570 GR	982 GR	975 GR	1160 GR	1135 GR	1646 GR	974 GR	1610 GR	1670 GR	1640 GR	
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 3550-5390	LL: 411-3569	DLL: 414-3558	GR/CNL: 2200-3811	GR/CNL: 2100-3755			COL/CNL: 3600-5453	COL/CNL: 3600-5453	COL/CNL: 3500-5400	
TULLY LIMESTONE	3598-	1896-	1886-	2180-	2116-	3730-	2015-	3642-	3640-	3564-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3852-	2096-	2034-	2360-	2300-	4000-	2186-	3906-	3902-	3826-	
ORISKANY SANDSTONE RIDGLEY SANDSTONE	3996-					4132-	2362-	4054-			
SILURIAN-DEVONIAN CARBONATES	4008-	2310-	2300-	2614-	2560-			4061-	4040-	3968-	
SALINA GROUP LOCKPORT DOLOMITE	4076- 4738-	2404- 2954-	2400- 2954-	2684- 3354-	2635- 3300-	4424- 4856-	2673- 3103-	4136- 4792-	4106- 4772-	4030- 4705-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5016- 5090-	3218- 3262-	3204- 3254-	3549- 3597-	3500- 3546-	5170- 5241-	3370- 3440-	5062- 5130-	5058- 5122-	4970- 5040-	
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5142- 5254- 5308-	3304- 3406- 3452-	3306- 3408- 3448-	3630- 3726- 3767-	3580- 3666- 3690-	5288- 5410- 5456-	3477- 3600- 3646-	5184- 5312- 5342-	5174- 5296- 5336-	5082- 5220- 5254-	
QUEENSTON FORMATION	5316-	3470-	3464-	3777-	3700-	5470-	3653-	5356-	5348-	5266-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	
PRODUCING INTERVAL	5154-5315	410-3573	413-3517	3671-3724	3628-3665	5312-5466	3498-3597	5227-5352	5213-5345	5155-5258	
TOTAL DEPTH	5395	3581	3527	3812	3763	5600	3597	5453	5453	5400	
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	
RESULTS	1,008 Mcf AF 1,200 psi/72 hrs. development Rome Athens field	814 Mcf AF 1,985 psi/24 hrs. development Bushnell-Lexington pool Conneaut field	814 Mcf AF 2,108 psi/48 hrs. development Bushnell-Lexington pool Conneaut field	1,100 Mcf AF 875 psi/48 hrs. development Lundys Lane pool Conneaut field	1,100 Mcf AF 800 psi/48 hrs. development Lundys Lane pool Conneaut field	1,108 Mcf AF 1,125 psi/72 hrs. development Vrooman pool Church Run field	1,108 Mcf AF 1,315 psi/72 hrs. development Vrooman pool Church Run field	30 Mcf AF 1,100 psi/72 hrs. development Indian Springs pool Conneaut field	850 Mcf AF 1,315 psi/72 hrs. development Vrooman pool Church Run field	1,040 Mcf AF 1,225 psi/72 hrs. development Vrooman pool Church Run field	3,147 Mcf AF 975 psi/72 hrs. development Hatchtown pool Church Run field

COUNTY Permit Number	Crawford 039-22913	Crawford 039-22918	Crawford 039-22920	Crawford 039-22924	Crawford 039-22925	Crawford 039-22926	Crawford 039-22927	Crawford 039-22928	Crawford 039-22929	Crawford 039-22930	
NAME OF WELL	Carl R. Proper #1	Charles Knapp #3	Charles Knapp #2	R. Laubscher #2	McCleary unit #2	Eagle Line Corp. #3	Arthur H. Burleigh #4	Arthur H. Burleigh #8	Milton Smithers #1	Frank Kuberly #1	
OPERATOR	Cabot Oil & Gas Corporation	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Ooran & Associates, Inc. #KP-140	Mark Resources Corporation	Ooran & Associates, Inc. #KP-141	Ooran & Associates, Inc. #KP-138	Ooran & Associates, Inc. #KP-139	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	
TOWNSHIP	Troy	Oil Creek	Oil Creek	Oil Creek	Wayne	Rome	Rome	Rome	Rome	Rome	
QUADRANGLE	Dempseytown	Titusville North	Titusville North	Titusville North	Sugar Lake	Spartansburg	Grand Valley	Grand Valley	Titusville North	Titusville North	
LATITUDE	4,120 ft. S 41°37'30"	8,530 ft. S 41°42'30"	7,005 ft. S 41°42'30"	14,380 ft. S 41°42'30"	9,700 ft. S 41°35'00"	15,090 ft. S 41°47'30"	11,690 ft. S 41°45'00"	13,090 ft. S 41°45'00"	12,540 ft. S 41°45'00"	12,980 ft. S 41°45'00"	
LONGITUDE	11,150 ft. W 79°47'30"	4,560 ft. W 79°40'00"	4,115 ft. W 79°40'00"	680 ft. W 79°37'30"	11,250 ft. W 79°52'30"	1,850 ft. W 79°37'30"	9,140 ft. W 79°35'00"	8,150 ft. W 79°35'00"	4,125 ft. W 79°42'30"	7,075 ft. W 79°42'30"	
DATE COMPLETED	9-29-87	11-11-87	11-17-87	9-24-87	11-19-87	9-23-87	9-24-87	8-26-87	12-18-87	10-21-87	
ELEVATION	1452 GR	1561 GR	1613 GR	1615 GR	1568 GR	1672 GR	1647 GR	1619 GR	1585 GR	1602 GR	
LOGS RECEIVED AND LOGGED INTERVALS	GR/PCL: 5000-5330	COL/CNL: 3600-5467	COL/CNL: 3600-5506	COL/GR: 3750-5625	COL/CNL/GR: 0-5522	COL/GR: 3470-5409	COL/GR: 0-5484	COL: 3650-5535	COL/CNL: 3450-5296	COL/CNL: 3500-5341	
TULLY LIMESTONE	3533-	3646-	3680-	3774-	3686-	3570-	3668-	3666-	3490-	3504-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3764-	3906-	3938-	4044-	3906-	3812-	3936-	3936-	3744-	3746-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3916-	4046-	4100-	4169-	4052-	3925-	4068-		3904-	3906-	
SILURIAN-DEVONIAN CARBONATES	3934-	4058-	4106-	4182-	4070-		4076-	4068-	3912-	3910-	
SALINA GROUP LOCKPORT DOLOMITE	4232- 4656-	4134- 4798-	4174- 4840-	4262- 4970-	4170- 4876-	4933-	4140- 4802-	4144- 4815-	3984- 4630-	3972- 4654-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5010- 5070-	5072- 5138-	5104- 5168-	5236- 5303-	5160- 5223-	4940-	5082- 5152-	5088- 5155-	4904- 4972-	4916- 4985-	
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5131- 5260- 5294-	5164- 5318- 5354-	5198- 5352- 5384-	5350- 5482- 5520-	5280- 5408- 5454-	5080-	5200- 5323- 5368-	5198- 5323- 5368-	5000- 5150- 5185-	5040- 5166- 5202-	
QUEENSTON FORMATION	5306-	5366-	5396-	5521-	5466-		5378-	5378-	5198-	5218-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	
PRODUCING INTERVAL	5184-5242	5199-5363	5226-5395	5401-5525	5307-5377	5146-5271	5267-5371	5247-5373	5087-5196	5053-5214	
TOTAL DEPTH	5376	5467	5506	5673	5536	5399	5540	5554	5296	5341	
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	
RESULTS	307 Mcf AF 1,290 psi/72 hrs. extension Diamond pool Troy field	1,188 Mcf AF 1,275 psi/72 hrs. development Rome pool Athens field	1,522 Mcf AF 1,175 psi/72 hrs. development Rome pool Athens field	675 Mcf AF 1,450 psi/72 hrs. development Porky Run pool Ootville field	300 Mcf AF 1,475 psi/72 hrs. development Wilson Mills pool Lake Creek field	920 Mcf AF 1,225 psi/72 hrs. development Hatchtown pool Church Run field	429 Mcf AF 1,350 psi/72 hrs. development Three Bridge pool Selkirk field	429 Mcf AF 1,350 psi/72 hrs. development Three Bridge pool Selkirk field	766 Mcf AF 1,425 psi/72 hrs. development Three Bridge pool Selkirk field	1,620 Mcf AF 1,250 psi/72 hrs. development Rome pool Athens field	1,300 Mcf AF 1,225 psi/72 hrs. development Rome pool Athens field

Figure 35. (Continued).

COUNTY Permit Number	Crawford 039-22932	Crawford 039-22933	Crawford 039-22934	Crawford 039-22936	Crawford 039-22938	Crawford 039-22939	Crawford 039-22940	Crawford 039-22941	Crawford 039-22945	Crawford 039-22947
NAME OF WELL	Joseph Bradford #1	Bradley Berkey #1	Oale Bement #1	B. Humber #3	O. P. Armstrong #1	E. & F. Smith #2	F. & R. Eakin #2	Jack E. McCool #1	R. Vosburgh #1	R. Crowther et al #1
OPERATOR	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Ooran & Associates, Inc. #KP-152	Olasu Exploration & Production, Inc.	Mark Resources Corporation
TOWNSHIP	Rome	Sparta	Rome	Rome	Troy	Wayne	Wayne	Rome	Dill Creek	Troy
QUADRANGLE	Titusville North	Spartansburg	Titusville North	Grand Valley	Oempseytown	Sugar Lake	Sugar Lake	Grand Valley	Titusville North	Oempseytown
LATITUDE	3,120 ft. S 41°45'00"	5,310 ft. S 41°47'30"	9,350 ft. S 41°45'00"	1,520 ft. S 41°42'30"	3,350 ft. S 41°37'30"	4,400 ft. S 41°35'00"	5,175 ft. S 41°35'00"	350 ft. S 41°42'30"	5,775 ft. S 41°42'30"	6,600 ft. S 41°57'30"
LONGITUDE	9,365 ft. W 79°42'30"	11,060 ft. W 79°37'30"	8,500 ft. W 79°42'30"	10,620 ft. W 79°35'00"	8,400 ft. W 79°50'00"	10,850 ft. W 79°52'30"	12,000 ft. W 79°52'30"	8,575 ft. W 79°35'00"	9,395 ft. W 79°37'30"	6,300 ft. W 79°50'00"
DATE COMPLETED	12-22-87	11-14-87	12-28-87	11-11-87	10-21-87	12-11-87	12-2-87	8-26-87	12-13-87	10-15-87
ELEVATION	1398 GR	1555 GR	1520 GR	1550 GR	1540 GR	1557 GR	1562 GR	1625 GR	1468 GR	1296 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CHL: 3200-4998	COL/CHL: 3350-5166	COL/CHL: 3350-5173		COL/CHL/GR: 0-5451		GR/PCU: 5100-5422	COL/GR: 0-5534	COL/CNL: 3500-5347	COL/CNL/GR: 0-5140
TULLY LIMESTONE	3220-	3384-	3390-	3620-	3559-	3632-	3650-	3690-	3576-	3354-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3414-	3682-	3628-	3892-	3784-	3847-	3875-	3960-	3788-	3482-
ORISKANY SANDSTONE RIDGELY SANDSTONE				4024-	3940-	3996-	4020-		3928-	3736-
SILURIAN-DEVONIAN CARBONATES	3634-	3788-	3802-		3950-	4017-	4040-	4090-	3936-	3750-
SALINA GROUP LOCKPORT DOLOMITE	3700- 4338-	3846- 4506-	3870- 4594-	4312- 4768-	4036- 4760-	4162- 4782-	4180- 4810-	4164- 4846-	4011- 4700-	3838- 4578-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4600- 4662-	4760- 4824-	4800- 4866-	5050- 5118-	5030- 5093-	5086- 5160-	5126- 5186-	5114- 5184-	4978- 5030-	4830- 4891-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	4718- 4838- 4873-	4877- 4995- 5030-	4923- 5045- 5076-	5182- 5306- 5332-	5150- 5274- 5312-	5250- 5342- 5385-	5214- 5381- 5414-	5238- 5372- 5400-	5085- 5216- 5246-	4950- 5076- 5112-
QUEENSTON FORMATION	4892-	5047-	5096-	5350-	5326-	5399-	5427-	5410-	5258-	5125-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4746-4890	4916-5046	4982-5092	5225-5345	5190-5244	5264-5292	5292-5365	5297-5404	5140-5255	4987-5072
TOTAL DEPTH	4990	5166	5173	5477	5452	5510	5504	5563	5365	5182
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,904 McF AF 1,225 psi/72 hrs. development Rome pool Athens field	1,243 McF AF 1,150 psi/72 hrs. development Hatchtown pool Church Run field	1,370 McF AF 1,150 psi/72 hrs. development Rome pool Athens field	1,021 McF AF 1,150 psi/72 hrs. development Vrooman pool Church Run field	120 McF AF 1,465 psi/72 hrs. development Crawther pool Fauntetown field	65 McF AF 1,450 psi/72 hrs. development Wilson Mills pool Lake Creek field	85 McF AF 1,420 psi/72 hrs. development Wilson Mills pool Lake Creek field	786 McF AF 1,325 psi/72 hrs. development Three Bridge pool Sal Kirk field	9,667 McF AF 1,065 psi/72 hrs. development Vrooman pool Church Run field	113 McF AF 1,475 psi/72 hrs. development Crawther pool Fauntetown field

COUNTY Permit Number	Crawford 039-22948	Crawford 039-22949	Crawford 039-22951	Crawford 039-22952	Crawford 039-22954	Crawford 039-22955	Crawford 039-22956	Crawford 039-22957	Crawford 039-22958	Crawford 039-22959
NAME OF WELL	Donald McCray #3	Donald McCray #2	Donald McCray #4	Harry E. Firth #2	Hook Unit #2	Gordon Turk #1	Andrew Byler #2	James Murphy #1	C. Burrows #3	Frank Nichols #1
OPERATOR	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Ooran & Associates, Inc. #KP-160	Quaker State Corporation	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Ooran & Associates, Inc. #KP-191	Olasu Exploration & Production, Inc.
TOWNSHIP	Sparta	Sparta	Sparta	Sparta	Dill Creek	Dill Creek	Sparta	Rome	Dill Creek	Sparta
QUADRANGLE	Spartansburg	Spartansburg	Spartansburg	Spartansburg	Grand Valley	Titusville North	Lake Canadonta	Titusville North	Grand Valley	Spartansburg
LATITUDE	11,850 ft. S 41°50'00"	13,800 ft. S 41°50'00"	14,880 ft. S 41°50'00"	2,380 ft. S 41°47'30"	1,020 ft. S 41°40'00"	12,200 ft. S 41°42'30"	10,770 ft. S 41°50'00"	7,900 ft. S 41°45'00"	10,975 ft. S 41°42'30"	13,200 ft. S 41°50'00"
LONGITUDE	1,920 ft. W 79°42'30"	5,455 ft. W 79°42'30"	4,690 ft. W 79°42'30"	5,510 ft. W 79°42'30"	9,010 ft. W 79°35'00"	2,250 ft. W 79°42'30"	3,940 ft. W 79°45'00"	4,710 ft. W 79°42'30"	9,175 ft. W 79°35'00"	4,630 ft. W 79°37'30"
DATE COMPLETED	8-26-87	9-3-87	10-1-87	9-24-87	9-24-87	11-25-87	10-7-87	10-15-87	2-18-88	12-4-87
ELEVATION	1565 GR	1550 GR	1548 GR	1414 GR	1535 GR	1470 GR	1520 GR	1570 GR	1645 GR	1570 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 3200-5022	COL/CNL: 3250-4980	COL/CNL: 3200-4999	COL/CNL: 3100-4896	COL/GR: 3735-5616		COL/CNL: 3100-4902	COL/CNL: 3400-5240	COL/GR: 0-5674	COL/CNL: 3250-5117
TULLY LIMESTONE	3232-	3218-	3230-	3110-	3724-	3561-	3140-	3430-	3772-	3322-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3474-	3458-	3470-	3348-	3997-	3808-	3376-	3674-	4048-	3574-
ONISKANY SANDSTONE RIDGELEY SANDSTONE					4121-	3944-		4172-		
SILURIAN-DEVONIAN CARBONATES	3652-	3630-	3636-	3512-	4146-	3965-	3546-	3850-	4190-	3730-
SALINA GROUP LOCKPORT DOLOMITE	3732- 4326-	3690- 4310-	3696- 4328-	3574- 4206-	4218- 4844-	4083- 4686-	3600- 4186-	3924- 4560-	4240- 4950-	3790- 4438-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4596- 4656-	4578- 4642-	4614- 4662-	4480- 4540-	5198- 5268-	4920- 5951-	4500- 4560-	4840- 4902-	5236- 5306-	4712- 4778-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	4708- 4826- 4862-	4606- 4832- 4848-	4712- 4432- 4870-	4592- 4716- 4748-	5315- 5850- 5186-	5108- 5220- 5269-	4608- 4732- 4764-	4956- 5080- 5116-	5352- 5402- 5520-	4830- 4952- 4984-
QUEENSTON FORMATION	4876-	4862-	4884-	4752-	5498-	5277-	4776-	5136-	5532-	4994-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4745-4874	4725-4856	4761-4881	4630-4759	5364-5493	5218-5275	4680-4774	4986-5131	5396-5527	4479-4993
TOTAL DEPTH	5022	4980	4999	4887	5631	5422	4906	5240	5691	5117
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	2,100 Mcf AF 1,175 psi/72 hrs. development Brimstone pool Athens field	3,213 Mcf AF 1,200 psi/72 hrs. development Brimstone pool Athens field	2,818 Mcf AF 1,175 psi/72 hrs. development Brimstone pool Athens field	5,443 Mcf AF 1,285 psi/72 hrs. development Brimstone pool Athens field	1,136 Mcf AF 1,475 psi/72 hrs. development Porky Run pool Ootville field	1,500 Mcf AF 1,000 psi/456 hrs. New pool discovery Gillson Ridge pool Church Run field	521 Mcf AF 1,130 psi/72 hrs. development Dutch Hill pool Athens field	1,361 Mcf AF 1,300 psi/72 hrs. development Rome Athens field	400 Mcf AF 1,320 psi/72 hrs. development Porky Run pool Ootville field	1,471 Mcf AF 1,350 psi/72 hrs. development Eastman Hill pool Sparta field

Figure 35. (Continued).

COUNTY Permit Number	Crawford 039-22960	Crawford 039-22961	Crawford 039-22962	Crawford 039-22963	Crawford 039-22964	Crawford 039-22965	Crawford 039-22966	Crawford 039-22967	Crawford 039-22969	Crawford 039-22970
NAME OF WELL	Steven E. Renama #1	Steven E. Renama #1-A	Steven E. Renama #2	W. J. Hyde, Sr. #6	W. J. Hyde, Sr. #5	W. J. Hyde, Sr. #6	Roggenkamp #1	Keyes #1	Bessie Southwick #2	F. A. McKuhn #2
OPERATOR	Ooran & Associates, Inc. #KP-171	Ooran & Associates, Inc. #KP-170	Ooran & Associates, Inc. #KP-172	James Drilling Corporation	James Drilling Corporation	James Drilling Corporation	Quaker State Corporation	Quaker State Corporation	Wainco Oil & Gas Company #W-232	Wainco Oil & Gas Company #W-142
TOWNSHIP	Oil Creek	Oil Creek	Oil Creek	Beaver	Beaver	Beaver	Oil Creek	Oil Creek	Rome	Rome
QUADRANGLE	Titusville North	Titusville North	Titusville North	Beaver Center	Beaver Center	Beaver Center	Titusville North	Grand Valley	Spartansburg	Spartansburg
LATITUDE	7,720 ft. S 41°42'30"	7,800 ft. S 41°42'30"	6,120 ft. S 41°42'30"	11,700 ft. S 41°50'00"	4,220 ft. S 41°55'00"	4,260 ft. S 41°50'00"	2,300 ft. S 41°40'00"	2,500 ft. S 41°40'00"	12,570 ft. S 41°47'30"	8,780 ft. S 41°47'30"
LONGITUDE	2,550 ft. W 79°37'30"	4,300 ft. W 79°37'30"	3,420 ft. W 79°37'30"	10,480 ft. W 80°22'30"	9,740 ft. W 80°22'30"	6,200 ft. W 80°22'30"	3,320 ft. W 79°37'30"	9,050 ft. W 79°35'00"	8,260 ft. W 79°40'00"	740 ft. W 79°42'30"
DATE COMPLETED	1-5-88	12-21-87	12-28-87	10-30-87	11-6-87	11-5-87	12-12-87	11-24-87	11-11-87	11-18-87
ELEVATION	1605 GR	1605 GR	1552 GR	1028 GR	969 GR	895 GR	1575 GR	1400 GR	1665 GR	1450 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL/GR: 0-5543	CDL/GR: 0-5528	CDL/GR: 3550-5486	CDL: 250-3698 GR: 3450-3686 GO: 3450-3698	CDL: 250-3585 GR: 3350-3570 GO: 3250-3570	CDL: 250-3551 GR: 3270-3533 GO: 3250-3540		COL: 0-5359	COL: 0-5359	GR/CDL: 0-5065
TULLY LIMESTONE	3700-	3690-	3646-	2042-			3753-	3600-	3526-	3228-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3718-	3952-	3912-	2210-	2160-	2060-	4022-	3873-	3772-	3470-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4100-	4084-	4050-	2450-		2274-	4151-	3993-		
SILURIAN-DEVONIAN CARBONATES	4112-	4096-	4062-	2462-	2380-	2288-	4174-	4016-	3928-	3630-
SALINA GROUP LOCKPORT DOLOMITE	4188- 4860-	4170- 4872-	4142- 4880-	2530- 3158-	2056- 3068-	2304- 2988-	4296- 4915-	4144- 4785-	3990- 4622-	3688- 4332-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5150- 5212-	5140- 5206-	5086- 5154-	3406- 3476-	3318- 3374-	3250- 3304-	5149- 5286-	5003- 5146-	4880- 4953-	4590- 4666-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5216- 5396- 5428-	5258- 5390- 5420-	5210- 5347- 5370-	3508- 3682-	3408-	3336- 3426- 3494-	5334- 5476- 5505-	5190- 5333- 5364-	5002- 5113- 5166-	4710- 4830- 4879-
QUEENSTON FORMATION	5440-	5430-	5378-	3690-		3515-	5516-	5373-	5182-	4888-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5316-5434	5314-5425	5266-5300	3570-3592	3458-3495	3396-3422	5383-5512	5247-5371	5050-5172	4746-4886
TOTAL DEPTH	5580	5593	5521	3710	3587	3553	5633	5509	5359	5065
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,300 Mcf AF development Vrooman pool Church Run field	300 Mcf AF development Vrooman pool Church Run field	400 Mcf AF development Vrooman pool Church Run field	250 Mcf AF Show of oil 950 psi/120 hrs. development Stone Run pool Conneaut field	250 Mcf AF Show of oil 875 psi/120 hrs. development Stone Run pool Conneaut field	250 Mcf AF Show of oil 960 psi/120 hrs. development Stone Run pool Conneaut field	2,000 Mcf AF development Bates Hollow pool Church Run field	1,300 Mcf AF development Porky Run pool Oakville field	1,055 Mcf AF development Rock Run pool Athens field	1,311 Mcf AF development Rock Run pool Athens field

COUNTY Permit Number	Crawford 039-22971	Crawford 039-22972	Crawford 039-22973	Crawford 039-22974	Crawford 039-22975	Crawford 039-22976	Crawford 039-22977	Crawford 039-22978	Crawford 039-22979	Crawford 039-22980
NAME OF WELL	Roy Crouser #1	Donald Herman #1	Robert Hill #1	Elmer Ziltbaver #4	Gorothy Devrnja #1	Dorothy Devrnja #2	Gorothy Devrnja #3	F. J. Firth, Jr. #1	V. L. Gilson, Jr. #1	Harry C. Graves #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Meridian Exploration #949	James Orilling Corporation	James Orilling Corporation	James Orilling Corporation	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.
TOWNSHIP	Troy	Wayne	Wayne	Rockdale	Spring	Spring	Spring	Sparta	Rome	Sparta
QUADRANGLE	Oempseytown	Sugar Lake	Sugar Lake	Cambridge Springs	Beaver Center	Beaver Center	Beaver Center	Spartansburg	Titusville North	Spartansburg
LATITUDE	8,700 ft. S 41°37'30"	8,140 ft. S 41°35'00"	12,200 ft. S 41°35'00"	5,310 ft. S 41°50'00"	5,540 ft. S 41°50'00"	5,650 ft. S 41°50'00"	7,090 ft. S 41°50'00"	12,430 ft. S 41°50'00"	1,080 ft. S 41°42'30"	13,500 ft. S 41°50'00"
LONGITUDE	1,320 ft. W 79°50'00"	550 ft. W 79°55'00"	6,220 ft. W 79°55'00"	310 ft. W 80°00'00"	6,410 ft. W 80°22'30"	8,020 ft. W 80°22'30"	7,550 ft. W 80°22'30"	6,270 ft. W 79°42'30"	9,050 ft. W 79°42'30"	9,110 ft. W 79°37'30"
DATE COMPLETED	12-10-87	1-20-88	2-24-88	3-28-88	11-23-87	12-15-87	12-21-87	1-21-88	1-5-88	12-14-87
ELEVATION	1535 GR	1540 GR	1550 GR	1421 GR	933 GR	1002 GR	1009 GR	1560 GR	1629 GR	1585 GR
LOGS RECEIVED AND LOGGED INTERVALS	PCL: 5100-5350			COL/CNL: 2420-4448 OIL: 4110-4440 GR: 4221-4321 GQ: 4168-4375	COL: 250-3582 GR: 3330-3271 GQ: 3200-3562	COL: 250-3651 GR: 3320-3647 GQ: 3400-3636	COL: 250-3707 GR: 3400-3703 GQ: 3350-3700	COL/CNL: 3150-4970	COL/CNL: 3500-5365	COL/CNL: 3300-5130
TULLY LIMESTONE	3640-	3671-	3664-	2764-				3225-	3556-	3338-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3870-	3852-	3897-	2984-	2112-	2184-	2196-	3468-	3795-	3575-
ORISKANY SANDSTONE RIDGELY SANDSTONE	4016-	4001-	4051-			2392-	2400-			
SILURIAN-DEVONIAN CARBONATES	4044-	4031-	4083-	3166-	2300-	2404-	2404-	3636-	3948-	3740-
SALINA GROUP LOCKPORT DOLOMITE	4338- 4756-	4328- 4757-	4384- 4816-	3236- 3830-	2438- 3040-	2516- 3116-	2516- 3124-	3692- 4316-	4016- 4670-	3798- 4460-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5108- 5173-	5113- 5176-	5176- 5238-	4100- 4156-	3294- 3342-	3364- 3420-	3370- 3438-	4590- 4652-	4965- 5032-	4710- 4774-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5181- 5368- 5397-	5230- 5369- 5418-	5342- 5334- 5467-	4191- 4326- 4360-	3376-	3454- 3570- 3610-	3460- 3650- 3636-	4700- 4820- 4856-	5086- 5112- 5244-	4796- 4916- 4982-
QUEENSTON FORMATION	5409-	5436-	5478-	4372-		3634-	3646-	4870-	5258-	4994-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5271-5302	5291-5337	5348-5378	4221-4321	3435-3487	3512-3565	3522-3604	4732-4868	5120-5255	4832-4992
TOTAL DEPTH	5474	5450	5543	4456	3589	3653	3709	4970	5365	5150
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	600 Mcf AF 1,300 psi/148 hrs. development Oamond Troy field	600 Mcf AF 1,175 psi/148 hrs. development Wilson Mills Lake Creek field	650 Mcf AF 1,300 psi/148 hrs. development Wilson Mills Lake Creek field	2,085 Mcf AF 1,140 psi/168 hrs. development Rockdale field	250 Mcf AF 960 psi/120 hrs. development Stoneboro pool Conneaut field	250 Mcf AF Show of oil 835 psi/120 hrs. development Stone Run pool Conneaut field	250 Mcf AF Show of oil 700 psi/120 hrs. development Stoneboro pool Conneaut field	250 Mcf AF 1,275 psi/72 hrs. development Ouch Hill pool Athens field	880 Mcf AF 1,100 psi/72 hrs. development Rome pool Athens field	787 Mcf AF 1,150 psi/72 hrs development Eastman Hill pool Sparta field

Figure 35. (Continued).

COUNTY Permit Number	Crawford 039-22981	Crawford 039-22982	Crawford 039-22983	Crawford 039-22984	Crawford 039-22985	Crawford 039-22992	Crawford 039-22993	Crawford 039-22994	Crawford 039-22995	Crawford 039-22996
NAME OF WELL	Marlon Alsdorf #1	Dennis B. Halfast #1	M. R. Rogers, Jr. #1	L. E. Reagle #1	Terry A. Bedow #1	Harry E. Firth #4	Harold L. Crosby #1	George McPheters #1	Leroy Glover #4	Charles Olynik #1
OPERATOR	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Olasu Exploration & Production, Inc.	Cabot Oil & Gas Corporation	Meridian Exploration #946	Commodore Energy Company
TOWNSHIP	Sparta	Rome	Sparta	Rome	Sparta	Sparta	Sparta	Troy	Bloomfield	Venango
QUADRANGLE	Lake Canadohta	Titusville North	Spartansburg	Titusville North	Spartansburg	Spartansburg	Spartansburg	Dempseytown	Millers Station	Edinboro South
LATITUDE	3,420 ft. S 41°50'00"	13,780 ft. S 41°45'00"	10,140 ft. S 41°50'00"	500 ft. S 41°42'30"	13,800 ft. S 41°50'00"	2,350 ft. S 41°47'30"	10,790 ft. S 41°50'00"	13,520 ft. S 41°37'30"	2,400 ft. S 41°50'00"	9,100 ft. S 41°50'00"
LONGITUDE	5,220 ft. W 79°45'00"	5,520 ft. W 79°42'30"	380 ft. W 79°42'30"	7,580 ft. W 79°42'30"	4,050 ft. W 79°42'30"	6,950 ft. W 79°42'30"	10,240 ft. W 79°40'00"	4,880 ft. W 79°50'00"	5,830 ft. W 79°52'30"	1,260 ft. W 80°07'30"
DATE COMPLETED	3-8-88	1-14-88	2-4-88	1-8-88	12-30-87	2-17-88	1-27-88	8-23-88	3-17-88	1-23-88
ELEVATION	1603 GR	1554 GR	1464 GR	1600 GR	1515 GR	1361 GR	1418 GR	1438 GR	1664 GR	1255 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 3050-4883	COL/CNL: 3450-5270	COL/CNL: 3100-4873	COL/CNL: 3500-5333	COL/CNL: 3250-5051	COL/CNL: 3000-4929	COL/CNL: 3100-4842	GR: 2300-4012	COL/CNL: 2700-4755 OIL/OLL: 2700-4750 INT: 3908-4086 PCL: 3934-4081	COL/CNL: 2150-4235 LL: 2201-4234 INT: 3908-4086 PCL: 3934-4081
TULLY LIMESTONE	3162-	3470-	3141-	3530-	3275-	3080-	3108-	2365-	3070-	2464-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3406-	3710-	3384-	3770-	3522-	3318-	3350-	2548-	3296-	2666-
ORISKANY SANDSTONE RIDGELEY SANDSTONE				3934-						2870-
SILURIAN-DEVONIAN CARBONATES	3596-	3870-	3550-	3942-	3690-	3488-	3516-	2746-	3480-	2894-
SALINA GROUP LOCKPORT DOLOMITE	3632- 4232-	3938- 4634-	3605- 4223-	4006- 4669-	3756- 4352-	3556- 4190-	3570- 4202-	2826- 3482-	3540- 4132-	2936- 3544-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4498- 4557-	4886- 4952-	4486- 4550-	4940- 5010-	4630- 4640-	4450- 4515-	4460- 4526-	3746- 3798-	4401- 4459-	3816- 3872-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	4602- 4730- 4764-	5006- 5130- 5166-	4604- 4720- 4760-	5070- 5192- 5274-	4714- 4868- 4898-	4565- 4686- 4722-	4576- 4696- 4784-	3838- 3928- 3956-	4500- 4580- 4660-	3910- 4032- 4076-
QUEENSTON FORMATION	4778-	5176-	4772-	5286-	4912-	4786-	4792-	3968-	4674-	4084-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4632-4771	5039-5170	4639-4769	5141-5234	4802-4911	4607-4730	4609-4741	5195-5233	4544-4671	3932-4081
TOTAL DEPTH	4883	5270	4873	5333	5051	4829	4842	5394	4795	4241
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,040 Mcf AF 1,150 psi/72 hrs. development Ouch Hill pool Athens field	476 Mcf AF 745 psi/72 hrs. development Rome pool Athens field	551 Mcf AF 1,095 psi/72 hrs. development Dutch Hill pool Athens field	1,079 Mcf AF 1,180 psi/72 hrs. development Rome pool Athens field	681 Mcf AF 1,175 psi/72 hrs. extension Eastman Hill pool Sparta field	2,570 Mcf AF 1,190 psi/72 hrs. development Brimstone pool Athens field	1,019 Mcf AF 1,255 psi/72 hrs. development Brimstone pool Athens field	600 Mcf AF 1,350 psi/72 hrs. development Beatty Run pool Cooperstown field	361 Mcf AF 1,230 psi/72 hrs. development Rockdale field	800 Mcf AF 1,090 psi/72 hrs. development Cambridge Springs field

COUNTY Permit Number	Crawford 039-22997	Crawford 039-22998	Crawford 039-22999	Crawford 039-23001	Crawford 039-23002	Crawford 039-23004	Crawford 039-23005	Crawford 039-23009	Crawford 039-23011	Crawford 039-23019
NAME OF WELL	Howard Elghmy #1	W. R. Smith #1	Charles Dlynik #2	A. Foster #1	E. Moldenhauer #1	Klein Unit #1	Hoffman Unit #1	Faunce Unit #1	Harry E. Firth #3	Vanderhoff, J. #1
OPERATOR	Commodore Energy Company	Commodore Energy Company	Commodore Energy Company	Mark Resources Corporation	Commodore Energy Company	Mark Resources Corporation	Commodore Energy Company	Mark Resources Corporation	Olasu Exploration & Production, Inc.	McCorsick Resources Company
TOWNSHIP	Cussewago	Venango	Venango	Troy	Cussewago	Wayne	Venango	Troy	Sparta	Rome
QUADRANGLE	Edinboro South	Edinboro South	Edinboro South	Sugar Lake	Edinboro South	Sugar Lake	Cambridge Springs	Oespaeytown	Spartansburg	Titusville North
LATITUDE	180 ft. S 41°47'30"	11,630 ft. S 41°50'00"	7,150 ft. S 41°50'00"	2,650 ft. S 41°35'00"	13,850 ft. S 41°50'00"	7,650 ft. S 41°35'00"	9,175 ft. S 41°50'00"	1,200 ft. S 41°37'30"	1,400 ft. S 41°47'30"	2,850 ft. S 41°45'00"
LONGITUDE	4,800 ft. W 80°10'00"	2,790 ft. W 80°07'30"	950 ft. W 80°07'30"	250 ft. W 79°52'30"	2,230 ft. W 80°12'30"	8,100 ft. W 79°52'30"	8,235 ft. W 80°05'00"	5,200 ft. W 79°50'00"	3,920 ft. W 79°42'30"	8,400 ft. W 79°40'00"
DATE COMPLETED	2-1-88	3-7-88	2-11-88	6-27-88	2-24-88	2-12-88	8-18-88	8-12-88	2-24-88	10-21-88
ELEVATION	1428 GR	1273 GR	1245 GR	1464 GR	1178 GR	1488 GR	1225 GR	1368 GR	1505 GR	1660 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 2365-4374 LL: 2200-4371 INT: 4100-4280 PCL: 4103-4273	COL/CNL: 2500-4211 OLL: 2500-4199- OLL: 2500-4199- INT: 4100-4280 PCL: 4103-4273	COL/CNL: 2200-4184 OLL: 2200-4172 INT: 3880-4070 PCL: 3912-4058	GR/PCL: 5200-5411	COL/CNL: 2030-4089 OLL: 2177-4074 INT: 3790-3977	GR/PCL: 5200-5454	GR/CBL: 3299-4164	GR/PCL: 4900-5117	COL/CNL: 3150-4958	GR: 20-6824
TULLY LIMESTONE	2656-	2494-	2434-	3574-	2352-	3612-	2454-	3383-	3204-	3543-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2848-	2696-	2638-	3795-	2540-	3834-	2658-	3606-	3444-	3786-
ORISKANY SANDSTONE RIDGLEY SANDSTONE	3044-		2850-	3936-		3981-		3760-		
SILURIAN-DEVONIAN CARBONATES	3050-	2895-	2864-	3975-	2734-	4010-	2858-	3782-	3608-	3946-
SALINA GROUP LOCKPORT DOLOMITE	3116- 3762-	2962- 3562-	2942- 3514-	4101- 4800-	2808- 3448-	4106- 4759-	3130- 3552-	3904- 4700-	3668- 4342-	4014- 4653-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4011- 4066-	3851- 3906-	3798- 3850-	5069- 5138-	3708- 3760-	5048- 5136-	3776- 3858-	4839- 4900-	4600- 4642-	4970- 5066-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	4102- 4218- 4272-	3944- 4062- 4112-	3886- 3978- 4053-	5246- 5334- 5362-	3798- 3874- 3966-	5234- 5313- 5366-	3884- 3984- 4062-	4996- 5083- 5118-	4666- 4812- 4850-	5160- 5873-
QUEENSTON FORMATION	4280-	4121-	4062-	5376-	3974-	5377-	4074-	5132-	4862-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4103-4273	3974-4117	3912-4058	5250-5298	3822-3959	5246-5319	3938-4069	5004-5083	4729-4802	6151-6835
TOTAL DEPTH	4380	4215	4188	5450	4093	5493	4220	5200	4958	7047
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Medina
RESULTS	425 Mcf AF 1,130 psi/72 hrs. development Kastie Conneaut field	475 Mcf AF 1,150 psi/72 hrs. development Cambridge Springs field	650 Mcf AF 1,260 psi/72 hrs. development Cambridge Springs field	1,858 Mcf AF 1,350 psi/72 hrs. development Wilson Hills pool Lake Creek field	950 Mcf AF 1,050 psi/72 hrs. development Kastie Conneaut field	315 Mcf AF 1,405 psi/72 hrs. development Wilson Hills pool Lake Creek field	90 Mcf AF 1,000 psi/72 hrs. development Cambridge Springs field	400 Mcf AF 1,455 psi/72 hrs. development Crawther pool Faucesown field	4,714 Mcf AF 1,375 psi/72 hrs. development Briston pool Aber field	1,000 Mcf AF 1,090 psi/48 hrs. development Rock pool Aber field

Figure 35. (Continued).

COUNTY Permit Number	Crawford 039-23020	Crawford 039-23021	Crawford 039-23022	Crawford 039-23024	Crawford 039-23025	Crawford 039-23028	Crawford 039-23029	Crawford 039-23030	Crawford 039-23031	Crawford 039-23032
NAME OF WELL	Louis Carlson #1	Theodore Ryznar #1	Matthew Neiport #1	Willis-Tracy Unit #2	Kenneth L. Hyde #1	Steven Renema #4	Spartlywood #1	Wendell Minnigh #4	Elmer C. Rothrauff #1	Armstrong #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Diasu Exploration & Production, Inc.	M.A.T. Oil & Gas Exploration, Inc.	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation
TOWNSHIP	Wayne	Troy	Wayne	Troy	Troy	Rome	Dill Creek	Wayne	Troy	Troy
QUADRANGLE	Sugar Lake	Centerville	Sugar Lake	Dempseytown	Dempseytown	Grand Valley	Titusville North	Sugar Lake	Dempseytown	Dempseytown
LATITUDE	41°55'00" S 41°55'00" S	14°40'00" S 41°40'00" S	3,830 ft. S 41°35'00" S	5,100 ft. S 41°37'30" S	1,380 ft. S 41°37'30" S	3,200 ft. S 41°45'00" S	6,650 ft. S 41°42'30" S	14,800 ft. S 41°37'30" S	13,220 ft. S 41°37'30" S	750 ft. S 41°37'30" S
LONGITUDE	41°21'00" W 79°55'00" W	2,000 ft. W 79°47'30" W	910 ft. W 79°55'00" W	5,850 ft. W 79°50'00" W	3,310 ft. W 79°45'00" W	10,520 ft. W 79°35'00" W	1,450 ft. W 79°37'30" W	5,450 ft. W 79°52'30" W	9,400 ft. W 79°50'00" W	7,350 ft. W 79°50'00" W
DATE COMPLETED	7-21-88	7-20-88	8-20-88	8-3-88	10-7-88	7-5-88	6-21-88	7-27-88	7-29-88	7-25-88
ELEVATION	1479 GR	1510 GR	1581 GR	1304 GR	1616 GR	1585 GR	1605 GR	1550 GR	1403 GR	1463 GR
LOGS RECEIVED AND LOGGED INTERVALS			PCL: 5130-5441	GR: 4900-5159		CDL/CNL: 3500-5311			GR/PCL: 4990-5296	
TULLY LIMESTONE	3560-	2600-	3644-	3352-	3760-	3538-	3694-	3612-	3475-	3484-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3751-	3839-	3863-	3576-	4011-	3800-	3960-	3830-	3700-	3708-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3910-	3989-	4016-	3726-	4104-	3940-	4056-	3981-	3849-	3872-
SILURIAN-DEVONIAN CARBONATES	3938-	4012-	4042-	3752-	4180-	3946-	4090-	4005-	3872-	3896-
SALINA GROUP LOCKPORT DOLOMITE	4240- 4668-	4304- 4690-	4333- 4782-	3879- 4504-	4478- 4862-	4010- 4660-	4223- 4850-	4306- 4756-	4168- 4690-	4010- 4626-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5025- 5080-	5049- 5111-	5108- 5180-	4780- 4882-	5224- 5288-	4945- 5005-	5072- 5205-	5114- 5174-	4966- 5030-	4942- 5006-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5130- 5282- 5310-	5267- 5294- 5330-	5234- 5387- 5408-	4968- 5071- 5104-	5346- 5472- 5510-	5055- 5188- 5218-	5256- 5387- 5423-	5230- 5357- 5401-	5089- 5209- 5252-	5093- 5190- 5228-
QUEENSTON FORMATION	5321-	5341-	5422-	5119-	5520-	5230-	5434-	5414-	5265-	5238-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5183-5214	5218-5269	5284-5320	4977-5065	5359-5418	5121-5224	5300-5432	5287-5313	5136-5156	5102-5188
TOTAL DEPTH	5383	5440	5490	5200	5590	5311	5600	5485	5348	5282
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,410 Mcf AF development Wilson Mills Lake Creek field	550 Mcf AF 1,350 psi/48 hrs. development Diamond Troy field	400 Mcf AF 1,100 psi/48 hrs. development Wilson Mills Lake Creek field	330 Mcf AF 1,175 psi/72 hrs. development Crawther pool Fauntceton field	600 Mcf AF 1,320 psi/48 hrs. development Gresham pool Breedtown field	2,100 Mcf AF 1,145 psi/72 hrs. development Vrooman pool Church Run field	1,600 Mcf AF 1,250 psi/51 hrs. development Vrooman pool Church Run field	550 Mcf AF 1,170 psi/48 hrs. extension Wilson Mills pool Lake Creek field	600 Mcf AF 1,425 psi/48 hrs. development Wilson Mills pool Lake Creek field	40 Mcf AF 1,340 psi/72 hrs. development Crawther pool Fauntceton field

COUNTY Permit Number	Crawford 039-23035	Crawford 039-23037	Crawford 039-23038	Crawford 039-23039	Crawford 039-23040	Crawford 039-23042	Crawford 039-23045	Crawford 039-23048	Crawford 039-23049	Crawford 039-23051
NAME OF WELL	E. Jones Unit #1	C. Podojil #1	Proper Unit #1	C. Olynik #3	John H. Sullivan #1	Elizabeth F. Roeder #3	Hubert E. Vanderhoff #2	West Unit #1	Merry #2N	Charles H. Bruckner #2
OPERATOR	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Commodore Energy Company	Cabot Oil & Gas Corporation	Walco Oil & Gas Company #W-235	Walco Oil & Gas Company #W-250	Mark Resources Corporation	Mark Resources Corporation	Walco Oil & Gas Company #W-244
TOWNSHIP	Troy	Troy	Troy	Venango	Troy	Rome	Rome	Troy	Rome	Rome
QUADRANGLE	Dempseytown	Sugar Lake	Centerville	Edinboro South	Centerville	Titusville North	Titusville North	Centerville	Titusville North	Spartansburg
LATITUDE	250 ft. S 41°37'30"	14,400 ft. S 41°37'30"	9,350 ft. S 41°40'00"	6,800 ft. S 41°50'00"	14,400 ft. S 41°40'00"	10,230 ft. S 41°45'00"	2,210 ft. S 41°45'00"	10,900 ft. S 41°40'00"	3,550 ft. S 41°42'30"	9,200 ft. S 41°47'30"
LONGITUDE	9,800 ft. W 79°45'00"	200 ft. W 79°52'30"	4,200 ft. W 79°45'00"	2,950 ft. W 80°07'30"	7,100 ft. W 79°45'00"	4,120 ft. W 79°37'30"	8,400 ft. W 79°40'00"	2,050 ft. W 79°50'00"	5,750 ft. W 79°37'30"	11,250 ft. W 79°37'30"
DATE COMPLETED	8-25-88	9-27-88	7-27-88	8-18-88	9-14-88	9-26-88	9-16-88	8-26-88	8-31-88	10-20-88
ELEVATION	1518 GR	1325 GR	1610 GR	1295 GR	1548 GR	1536 GR	1660 GR	1565 GR	1479 GR	1675 GR
LOGS RECEIVED AND LOGGED INTERVALS	GR: 4100-5394	GR/PCL: 5250-5508	GR/PCL: 5250-5508	COL/CNL: 2400-4184 DU: 2400-4202 INT: 2400-4110 PCL: 3952-4035	GR/PCL: 5130-5442	COL/CNL: 3500-5393 INT: 3500-5393 DU: 3500-5393	COL/CNL: 3500-5351 INT: 3500-5351 DU: 3500-5351			COL/CNL: 3450-5323 INT: 3450-5323 DU: 3450-5323
TULLY LIMESTONE	3630-	3406-	3708-	2482-	3666-	3546-	3540-	3566-	3530-	3530-
ONONDAGA LIMESTONE MUNTERSVILLE CHERT	3876-	3628-	3954-	2684-	3913-	3780-	3781-	3792-	3794-	3778-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4022-	3772-	3994-	2894-	4060-			3942-	3934-	3930-
SILURIAN-DEVONIAN CARBONATES	4054-	3798-	4120-	2897-	4084-	3963-	3942-	3968-	3954-	3946-
SALINA GROUP LOCKPORT DOLOMITE	4174- 4778-	3936- 4578-	4238- 4832-	2962- 3568-	4366- 4766-	4038- 4668-	4008- 4630-	4088- 4686-	4060- 4640-	3998- 4610-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5092- 5152-	4902- 4964-	5158- 5218-	3838- 3892-	5182-	4958- 5021-	4870- 4976-	5006- 5066-	4960- 5028-	4850- 4946-
GRIMSBY FORMATION CAROL HEAD SHALE WHIRLPOOL SANDSTONE	5206- 5326- 5372-	5062- 5158- 5188-	5303- 5341- 5436-	3930- 4040- 4096-	5212- 5304- 5408-	5082- 5202- 5236-	5036- 5134- 5188-	5151- 5230- 5286-	5120- 5213- 5239-	4976- 5122- 5156-
QUEENSTON FORMATION	5382-	5205-	5450-	4102-	5419-	5244-	5205-	5298-	5256-	5178-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5246-5315	5065-5140	5325-5388	3952-4035	5308-5320	5131-5245	5096-5198	5165-5228	5212-5248	5049-5172
TOTAL DEPTH	5470	5290	5567	4221	5471	5380	5360	5375	5389	5325
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	55 Mcf AF 1,420 psi/72 hrs. development Graham pool Breedtown field	283 Mcf AF 1,435 psi/72 hrs. development Wilson Mills pool Lake Creek field	127 Mcf AF 1,425 psi/72 hrs. extension Diamond Troy field	210 Mcf AF 1,100 psi/72 hrs. development Cambridge Springs field	550 Mcf AF 1,370 psi/72 hrs. development Graham pool Breedtown field	1,905 Mcf AF 930 psi/72 hrs. development Vrooman pool Church Run field	412 Mcf AF 1,210 psi/72 hrs. development Rome Athens field	140 Mcf AF 1,350 psi/72 hrs. extension Crawther pool Fauncetown field	230 Mcf AF 1,330 psi/72 hrs. development Vrooman pool Church Run field	713 Mcf AF 1,300 psi/72 hrs. development Hatchtown pool Church Run field

Figure 35. (Continued).

COUNTY	Permit Number	Crawford 039-23053	Crawford 039-23054	Crawford 039-23056	Crawford 039-23058	Crawford 039-23059	Crawford 039-23060	Crawford 039-23064	Crawford 039-23065	Crawford 039-23066	Crawford 039-23072
NAME OF WELL		Floyd A. McKuhn #3	M. R. Roach #1	Leon P. Sanborn #2	Bean #1	Herman C. Denhler #1	Albert H. Ebitz #2	Moldenhauer #2	Workman #1	M. R. Roach Unit #2	J. L. Fuller #1
OPERATOR		Wainco Oil & Gas Company #W-241	Commodore Energy Company	Wainco Oil & Gas Company #W-258	John W. Greene, Sr.	Cabot Oil & Gas Corporation	Wainco Oil & Gas Company #W-230	Commodore Energy Company	Tetra Energy Group, Ltd.	Commodore Energy Company	James Drilling Corporation
TOWNSHIP		Rome	Venango	Rome	Spring	Wayne	Rome	Cussewago	Conneaut	Venango	Beaver
QUADRANGLE		Spartansburg	Edinboro South	Spartansburg	Beaver Center	Sugar Lake	Spartansburg	Edinboro South	Beaver Center	Edinboro South	Beaver Center
LATITUDE		10.070 ft. S 41°47'30"	11.800 ft. S 41°50'00"	14.960 ft. S 41°47'30"	13.225 ft. S 41°50'00"	2.940 ft. S 41°35'00"	8.280 ft. S 41°47'30"	13.250 ft. S 41°50'00"	12.430 ft. S 41°47'30"	8.000 ft. S 41°50'00"	8.250 ft. S 41°47'30"
LONGITUDE		9.700 ft. W 79°40'00"	4.850 ft. W 80°07'30"	9.050 ft. W 79°42'30"	8.925 ft. W 80°22'30"	6.680 ft. W 79°55'00"	6.420 ft. W 79°40'00"	190 ft. W 80°12'30"	10.325 ft. W 80°27'30"	5.700 ft. W 80°07'30"	2.680 ft. W 80°27'30"
DATE COMPLETED		10-10-88	9-9-88	10-3-88	10-5-88	10-18-88	10-17-88	11-4-88	10-15-88	11-14-88	11-16-88
ELEVATION		1515 GR	1253 GR	1359 GR	1019 GR	1408 GR	1560 GR	1248 GR	1109 GR	1386 GR	1103 GR
LOGS RECEIVED AND LOGGED INTERVALS		COL/CNL: 3250-5141 INT: 3250-5141 GD: 3250-5141	COL/CNL: 2400-4186 OLL: 2400-4203 INT: 3933-4098 PCL: 3946-4090	COL/CNL: 3150-4983 INT: 3150-4983 GD: 3150-4983		COL/CNL: 3350-5170 INT: 3350-5170 GD: 3350-5170	COL/CNL: 2400-4116 OLL: 2397-4133 PCL: 3800-4125 INT: 2762-4040	COL/CNL: 2100-3849 GD/GR: 2100-3849 PCL: 3450-3824	COL/CNL: 2500-4300 OLL: 2500-4318 PCL: 3950-4298 INT: 2970-4200		COL/CNL: 200-3809 GR/CBL: 3510-3774 GD: 3500-3407
TULLY LIMESTONE		3326-	2480-	3164-	2030-	3446-	3368-	2420-		2580-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT		3570-	2682-	3408-	2199-	3650-	3622-	2610-	2316-	2776-	2308-
ORISKANY SANDSTONE RIDGELY SANDSTONE		3696-		3576-	2378-	3809-		2806-	2526-		2524-
SILURIAN-DEVONIAN CARBONATES		3728-	2878-	3578-		3836-		2810-	2534-	2988-	2535-
SALINA GROUP LOCKPORT DOLOMITE		3788- 4414-	2950- 3556-	3636- 4266-	2700- 3120-	4139- 4570-	3892- 4464-	2876- 3510-	2608- 3274-	3056- 3672-	2600- 3238-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		4692- 4752-	3826- 3879-	4534- 4600-	3392- 3462-	4928- 4989-	4720- 4799-	3772- 3826-	3522- 3572-	3932- 3986-	3477- 3540-
GRIMSBY FORMATION CABOT MEAD SHALE WHIRLPOOL SANDSTONE		4832- 4920- 4952-	3916- 4040- 4088-	4652- 4774- 4808-	3500- 3642- 3672-	5049- 5180- 5219-	4878- 4974- 5012-	3852- 3956- 4032-	3605- 3692- 3748-	4026- 4112- 4192-	3592- 3650- 3702-
QUEENSTON FORMATION		4978-	4096-	4824-	3680-	5232-	5010-	4038-	3754-	4196-	3716-
PRODUCING FORMATION		Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL		4862-4976	3946-4090	4719-4823	3520-3640	5107-5142	4890-5022	3886-4034	3622-3689	4061-4194	3620-3712
TOTAL DEPTH		5145	4219	4989	3766	5300	5170	4149	3877	4194	3811
DEEPEST FORMATION REACHED		Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS		2,011 Mcf AF 1,030 psi/72 hrs. development Cambridge Springs field	120 Mcf AF 1,050 psi/72 hrs. development Cambridge Springs field	907 Mcf AF 1,320 psi/72 hrs. development Rome Athens field	50 Mcf AF 1,050 psi/72 hrs. development Indian Springs field	450 Mcf AF 1,350 psi/72 hrs. development Wilson Mills Lake Creek field	746 Mcf AF 1,250 psi/72 hrs. development Rome Athens field	212 Mcf AF 1,100 psi/72 hrs. development Kastle Conneaut field	350 Mcf AF 700 psi/48 hrs. development Ferro Conneaut field	120 Mcf AF 1,125 psi/120 hrs development Cambridge Springs field	350 Mcf AF 1,125 psi/120 hrs. development Indian Springs pool Conneaut field

COUNTY Permit Number	Erie 049-21100	Erie 049-21193	Erie 049-21376	Erie 049-21405	Erie 049-21407	Erie 049-21408	Erie 049-21409	Erie 049-21411	Erie 049-21499	Erie 049-21500
NAME OF WELL	Schlesser #1	G. Kress #1	P. Petrusky #1	Edward Chylinski #2	Edward Chylinski #4	Gerald Orton #3	Gerald Orton #5	Gerald Orton #4	Ken Mealy #1	Raymond Nietupski #1
OPERATOR	C & C Troyer Brothers #27	Envirogas, Incorporated	C & C Troyer Brothers #39	Kaltaas Oil Company, Inc.	Kaltaas Oil Company, Inc.	Kaltaas Oil Company, Inc.	Kaltaas Oil Company, Inc.	Kaltaas Oil Company, Inc.	Kaltaas Oil Company, Inc.	Kaltaas Oil Company, Inc.
TOWNSHIP	Waterford	Greenfield	Washington	Greenfield	Greenfield	Greenfield	Greenfield	Venango	Greenfield	Greenfield
QUADRANGLE	Waterford	North East	Cambridge Spgs., NE	Wattsburg	Wattsburg	Hammett	Hammett	Hammett	Hammett	Wattsburg
LATITUDE	13,000 ft. S 41°57'30"	9,000 ft. S 42°10'00"	200 ft. S 41°55'00"	9,590 ft. S 42°07'30"	12,830 ft. S 42°50'00"	12,600 ft. S 42°07'30"	12,480 ft. S 42°07'30"	13,950 ft. S 42°07'30"	11,110 ft. S 42°07'30"	3,450 ft. S 42°07'30"
LONGITUDE	4,500 ft. W 79°57'30"	5,700 ft. W 79°45'00"	3,400 ft. W 80°05'00"	11,280 ft. W 79°50'00"	7,210 ft. W 79°50'00"	3,380 ft. W 79°52'30"	5,340 ft. W 79°52'30"	4,000 ft. W 79°52'30"	4,700 ft. W 78°52'30"	10,435 ft. W 79°50'00"
DATE COMPLETED	9-5-80	8-28-81	6-10-81	11-5-81	10-31-81	9-25-81	9-14-81	9-20-81	9-15-81	9-21-81
ELEVATION	1190 GR	1455 GR	1450 GR	1524 GR	1395 GR	1451 GR	1400 GR	1430 GR	1445 GR	1445 GR
LOGS RECEIVED AND LOGGED INTERVALS	GO: 3550-3891		PCL: 3919-3969	COL/CNL: 0-3777	COL/CNL: 0-3682	GR/CDL/CNL: 0-3702 GR/IL: 0-3696	GR/IL: 375-3630	GR/CDL/CNL: 0-3695	COL/CNL: 0-3690 GR/IL: 1915-3685 TRACER: 3300-3644	COL/CNL: 0-3640 IL/GR: 1934-3634 PCL: 3449-3561
TULLY LIMESTONE	2146-	2090-	2478-	2284-	2168-	2157-	2102-	2160-	2146-	2116-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2364-	2330-	2688-	2470-	2398-	2390-	2328-	2404-	2386-	2350-
ORISKANY SANDSTONE RIDGELEY SANDSTONE				2706-						
SILURIAN-DEVONIAN CARBONATES		2584-		2720-	2632-	2632-	2576-	2654-	2650-	2584-
SALINA GROUP LOCKPORT DOLOMITE		2694- 3058-		2788- 3228-	2666- 3130-	2706- 3150-	2664- 3078-	2722- 3200-	2718- 3128-	2664- 3096-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3592-	3314- 3366-	3800- 3854-	3464- 3506-	3364- 3416-	3370- 3428-	3320- 3386-	3398- 3444-	3370- 3434-	3308- 3374-
GRIMSBY FORMATION CARBON HEAD SHALE WHIRLPOOL SANDSTONE	3612- 3735- 3786-	3400- 3502- 3538-	3890- 4002- 4048-	3540- 3650- 3686-	3448- 3576- 3602-	3459- 3578- 3613-	3408- 3528- 3566-	3476- 3598- 3626-	3458- 3586- 3616-	3406- 3502- 3550-
QUEENSTON FORMATION	3796-	3558-	4058-	3598-	3614-	3622-	3577-	3638-	3628-	3563-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3648-3726	3419-3555	3919-3969	3558-3696	3534-3632	3503-3619	3447-3576	3494-3635	3496-3624	3449-3561
TOTAL DEPTH	3891	3638	4168	3778	3669	3702	3630	3698	3690	3640
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	IP not reported 1,180 psi/72 hrs. development Watford LeBeuf field	731 Mcf AF 1,000 psi/240 hrs. development Bull Reservoir North East field	400 Mcf AF 1,180 psi/168 hrs. development Edinboro North field	800 Mcf AF 900 psi/72 hrs. development Hornby North East field	3,000 Mcf AF 1,100 psi/120 hrs. development Hornby North East field	1,800 Mcf AF 1,040 psi/72 hrs. development Hornby North East field	800 Mcf AF 950 psi/72 hrs. development Hornby North East field	1,500 Mcf AF 1,060 psi/96 hrs. development Hornby North East field	900 Mcf AF 960 psi/72 hrs. development Hornby North East field	1,100 Mcf AF 1,020 psi/72 hrs. development Hornby North East field

Figure 35. (Continued).

COUNTY Permit Number	Erie 049-21502	Erie 049-21503	Erie 049-21610	Erie 049-21611	Erie 049-21612	Erie 049-21614	Erie 049-21627	Erie 049-21628	Erie 049-21672-P	Erie 049-21680
NAME OF WELL	E. Mary Henderson #1	E. Mary Henderson #2	Patricia McNaughton #1	Patricia McNaughton #2	Frank Patalon #3	Robert E. Drton #2	Wallace May #2	James K. Paslers #1	Robert Young #2	Douglas Gibbons #2
OPERATOR	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Envirogas, Incorporated	Kaltsas Oil Company, Inc.
TOWNSHIP	Venango	Venango	Greenfield	Greenfield	Greenfield	Greenfield	Greenfield	Greenfield	Waterford	Greenfield
QUADRANGLE	Wattsburg	Wattsburg	Hammett	Hammett	Wattsburg	Wattsburg	Hammett	Wattsburg	Waterford	Wattsburg
LATITUDE	300 ft. S 42°05'00"	14,310 ft. S 42°07'30"	10,700 ft. S 42°07'30"	12,110 ft. S 42°07'30"	10,750 ft. S 42°07'30"	8,650 ft. S 42°07'30"	10,000 ft. S 42°07'30"	11,290 ft. S 41°07'30"	5,500 ft. S 42°00'00"	13,300 ft. S 42°07'30"
LONGITUDE	6,300 ft. W 79°50'00"	5,450 ft. W 79°50'00"	600 ft. W 79°52'30"	550 ft. W 79°52'30"	6,440 ft. W 79°50'00"	8,550 ft. W 79°50'00"	3,950 ft. W 79°52'30"	8,600 ft. W 79°50'00"	6,700 ft. W 79°52'30"	8,600 ft. W 79°47'30"
DATE COMPLETED	1-28-82	3-9-82	11-2-81	1-7-82	11-7-81	12-15-81	11-10-81	11-30-81	11-14-81	3-4-82
ELEVATION	1349 GR	1349 GR	1475 GR	1445 GR	1380 GR	1435 GR	1430 GR	1470 GR	1430 GR	1411 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 1900-3659	COL/CNL: 2000-3639	COL: 0-3717	COL/CNL: 10-3697	COL/CNL: 0-3622	COL/CNL: 0-3690	COL/CNL: 0-3675	COL/CNL: 0-3734	COL/GR: 0-4007 OLL: 1931-3996	COL/CNL: 0-3725
TULLY LIMESTONE	2134-	2135-	2178-	2174-	2114-	2150-	2124-	2212-	2323-	2206-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2360-	2350-	2430-	2422-	2348-	2390-	2364-	2450-	2552-	2440-
ORISKANY SANDSTONE RIDGELEY SANDSTONE									2790-	
SILURIAN-DEVONIAN CARBONATES	2596-	2592-	2674-	2656-	2582-	2640-	2618-	2678-	2800-	2666-
SALINA GROUP LOCKPORT DOLOMITE	2666- 3108-	2660- 3084-	2740- 3184-	2730- 3170-	2652- 3066-	2714- 3145-	2696- 3120-	2748- 3196-	2858- 3436-	2734- 3150-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3338- 3384-	3328- 3384-	3410- 3462-	3400- 3442-	3320- 3366-	3382- 3404-	3366- 3412-	3426- 3470-	3662- 3728-	3408- 3454-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3418- 3540- 3564-	3416- 3538- 3562-	3476- 3608- 3638-	3486- 3588- 3622-	3390- 3514- 3544-	3454- 3570- 3602-	3444- 3560- 3590-	3502- 3612- 3650-	3756- 3874- 3915-	3476- 3588- 3636-
QUEENSTON FORMATION	3578-	3576-	3650-	3634-	3554-	3614-	3606-	3664-	3920-	3650-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina		Medina
PRODUCING INTERVAL	3444-3574	3462-3573	3529-3665	3505-3632	3459-3556	3473-3612	3470-3602	3536-3661		3525-3648
TOTAL DEPTH	3660	3640	3735	3697	3635	3690	3675	3730	4010	3726
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,800 Mcf AF 1,060 psi/48 hrs. development Hornby pool North East field	750 Mcf AF 940 psi/96 hrs. development Hornby pool North East field	900 Mcf AF 900 psi/120 hrs. development Hornby pool North East field	900 Mcf AF 920 psi/120 hrs. development Hornby pool North East field	1,150 Mcf AF 955 psi/76 hrs. development Hornby pool North East field	900 Mcf AF 990 psi/72 hrs. development Hornby pool North East field	1,400 Mcf AF 1,000 psi/120 hrs. development Hornby pool North East field	1,400 Mcf AF 1,050 psi/72 hrs. development Hornby pool North East field	Plugged and abandoned development Waterford pool Leboeuf field	1,400 Mcf AF 1,050 psi/48 hrs. development Little Hope pool North East field

COUNTY Permit Number	Erie 049-21681	Erie 049-21683	Erie 049-21684	Erie 049-21731	Erie 049-21733	Erie 049-21736	Erie 049-21791	Erie 049-21805	Erie 049-21842	Erie 049-21873
NAME OF WELL	Ralph Rogers #1	James Hopkins #1	Paul Weidle #1	Joseph Wroblewski #1	Paul Weidle #2	Robert Zelenak #1	Joseph Wroblewski #3	W. McGray #1	Robert Collopy #1	L. Allen #3
OPERATOR	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Kaltsas Oil Company, Inc.	Envirogas, Incorporated	Kaltsas Oil Company, Inc.	Envirogas, Incorporated	C & C Troyer Brothers #54	Envirogas, Incorporated
TOWNSHIP	Greenfield	Venango	Venango	Venango	Venango	Waterford	Venango	Greenfield	Washington	Amity
QUADRANGLE	Wattsburg	Wattsburg	Wattsburg	Wattsburg	Wattsburg	Waterford	Wattsburg	North East	Cambridge Spgs., NE	Waterford
LATITUDE	3,650 ft. S 42°07'30"	1,350 ft. S 42°05'00"	800 ft. S 41°05'00"	1,200 ft. S 42°05'00"	2,100 ft. S 41°05'00"	12,500 ft. S 42°00'00"	1,080 ft. S 42°05'00"	13,500 ft. S 42°10'00"	8,350 ft. S 41°55'00"	11,900 ft. S 42°00'00"
LONGITUDE	2,150 ft. W 79°50'00"	9,900 ft. W 79°50'00"	11,150 ft. W 79°50'00"	7,590 ft. W 79°47'30"	11,000 ft. W 79°50'00"	10,100 ft. W 79°52'30"	6,210 ft. W 79°47'30"	4,050 ft. W 79°45'00"	3,050 ft. W 80°05'00"	3,100 ft. W 79°52'30"
DATE COMPLETED	2-18-82	2-23-82	2-11-82	3-16-82	2-5-82	5-13-82	3-12-82	3-5-82	2-27-82	2-24-82
ELEVATION	1498 GR	1392 GR	1426 GR	1480 GR	1390 GR	1400 GR	1500 GR	1390 GR	1490 GR	1455 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 0-3722	COL/CNL: 0-3705	COL/CNL: 2150-3729	COL/CNL: 2200-3824	COL/CNL: 2150-3711	COL/CNL: 0-4044 OLL: 2032-4032	COL/CNL: 0-3910		COL: 2319-4298 FCL: 4055-4132	COL: 0-4060 OLL: 2052-4052
TULLY LIMESTONE	2202-	2178-	2200-	2308-	2180-	2324-	2350-	2072-	2576-	2370-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2430-	2412-	2436-	2542-	2410-	2554-	2584-	2314-	2792-	2610-
ORISKANY SANDSTONE RIDGELEY SANDSTONE			2680-		2662-	2786-			3054-	
SILURIAN-DEVONIAN CARBONATES	2698-	2636-	2696-	2772-	2674-	2796-	2812-	2551-	3060-	2838-
SALINA GROUP LOCKPORT DOLOMITE	2770- 3244-	2674- 3150-	2734- 3176-	2836- 3228-	2716- 3128-	2876- 3454-	2884- 3320-	2664- 3037-	3120- 3658-	2928- 3486-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3416- 3470-	3368- 3426-	3404- 3452-	3506- 3558-	3382- 3436-	3698- 3744-	3548- 3604-	3285- 3351-	3932- 3986-	3720- 3778-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3500- 3618- 3648-	3452- 3580- 3610-	3480- 3606- 3636-	3590- 3716- 3740-	3466- 3590- 3610-	3770- 3894- 3936-	3634- 3735- 3786-	3386- 3500- 3529-	4021- 4138- 4182-	3804- 3924- 3974-
QUEENSTON FORMATION	3652-	3622-	3648-	3742-	3630-	3948-	3796-	3545-	4190-	3984-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3523-3660	3492-3620	3516-3645	3633-3759	3515-3629	3809-3943	3684-3814	3408-3541	4055-4132	3835-3980
TOTAL DEPTH	3722	3705	3729	3825	3711	4047	3911	3635	4300	4063
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	900 McF AF 850 psi/66 hrs. development Hornby pool North East field	2,200 McF AF 900 psi/48 hrs. development Hornby pool North East field	1,000 McF AF 1,200 psi/48 hrs. development Hornby pool North East field	920 McF AF 960 psi/72 hrs. development Little Hope pool North East field	3,120 McF AF 1,300 psi/48 hrs. development Hornby pool North East field	6,200 McF AF 1,100 psi/48 hrs. development Waterford pool LeBoeuf field	1,200 McF AF 1,040 psi/72 hrs. development Little Hope pool North East field	1,000 McF AF 1,055 psi/240 hrs. development Bull Reservoir pool North East field	1,000 McF AF 1,100 psi/268 hrs. development Edinboro North field	4,000 McF AF 1,120 psi/240 hrs. development Waterford pool LeBoeuf field

Figure 35. (Continued).

COUNTY Permit Number	Erie 049-21875	Erie 049-21876	Erie 049-21891	Erie 049-21938	Erie 049-21968	Erie 049-22060	Erie 049-22573	Erie 049-22642	Erie 049-22691	Erie 049-22745
NAME OF WELL	Kenneth Davis #1	John Pandy #1	Harold Adams #3	John V. Kibbe #1	Wayne Lugalla #1	Kevin Michael #1	Cowley #1	Lloyd Schwab #3	Herbert Mercier #2	Richard Applebee #2
OPERATOR	C & C Troyer Brothers #56	C & C Troyer Brothers #55	C & C Troyer Brothers #58	Kaltsas Oil Company, Inc.	C & C Troyer Brothers #59	Goe Pro, Incorporated	Vineyard Oil & Gas Company	Kaltsas Oil Company, Inc.	N.E.A. Cross Company	Kaltsas Oil Company, Inc.
TOWNSHIP	Washington	Washington	Union	LeBoeuf	Waterford	Elk Creek	Waterford	Venango	Waterford	Venango
QUADRANGLE	Cambridge Spgs., NE	Cambridge Spgs., NE	Union City	Cambridge Springs	Cambridge Spgs., NE	Albion	Cambridge Spgs., NE	Wattsburg	Waterford	Wattsburg
LATITUDE	10,200 ft. S 41°55'00"	8,850 ft. S 41°55'00"	9,100 ft. S 41°55'00"	8,690 ft. S 41°52'30"	300 ft. S 41°55'00"	6,800 ft. S 41°55'00"	7,100 ft. S 41°57'30"	14,380 ft. S 42°07'30"	10,600 ft. S 42°00'00"	3,820 ft. S 42°05'00"
LONGITUDE	2,700 ft. W 80°05'00"	1,700 ft. W 80°05'00"	9,500 ft. W 79°47'30"	8,000 ft. W 80°00'00"	3,250 ft. W 80°02'30"	2,450 ft. W 80°17'30"	8,650 ft. W 80°00'00"	3,890 ft. W 79°47'30"	8,100 ft. W 79°55'00"	5,900 ft. W 79°47'30"
DATE COMPLETED	3-13-82	2-20-82	3-17-82	4-27-82	5-8-82	7-1-82	1-23-84	11-2-83	12-1-83	10-25-83
ELEVATION	1465 GR	1480 GR	1310 GR	1362 GR	1480 GR	1132 GR	1360 GR	1549 GR	1410 GR	1550 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL: 2550-4288 PCL: 4062-4094	COL: 2550-4285 PCL: 4054-4096	COL/LL: 2500-4336 PCL: 4062-4138		COL: 2200-4255 PCL: 3989-4031	COL: 2000-3652		COL: 1938-3972		
TULLY LIMESTONE	2568-	2576-	2574-	2584-	2540-	2008-	2376-	2264-	2266-	2284-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2780-	2788-	2818-	2816-	2756-	2198-	2592-	2485-	2490-	2518-
ORISKANY SANDSTONE RIDGELEY SANDSTONE							2780-			
SILURIAN-DEVONIAN CARBONATES	3038-	3042-	3038-		3024-	2458-			2744-	
SALINA GROUP LOCKPORT DOLOMITE	3104- 3670-	3106- 3650-	3100- 3684-	3152- 3622-	3090- 3594-	2518- 3058-	2918- 3400-	2712- 3049-	2842- 3372-	3054- 3216-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3928- 3982-	3926- 3980-	3940- 4006-	4022-	3858- 3918-	3340- 3390-	3670- 3740-	3451- 3518-	3630- 3682-	3537-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	4018- 4136- 4178-	4016- 4102- 4176-	4046- 4168- 4206-	4030- 4184- 4220-	3941- 4074- 4120-	3428- 3550- 3570-	3772- 3894- 3934-	3535- 3714- 3700-	3714- 3818- 3874-	3576- 3676- 3710-
QUEENSTON FORMATION	4188-	4184-	4218-	4226-	4124-	3596-	3944-	3712-	3884-	3718-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4062-4094	4054-4096	4082-4138	4090-4224	3989-4031	3465-3541	3793-3854	3581-3709	3773-3805	3631-3717
TOTAL DEPTH	4295	4293	4344	4300	4259	3668	4025	3794	3985	3807
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,800 Mcf AF 1,100 psi/168 hrs. development Edinboro North field	1,500 Mcf AF 1,100 psi/168 hrs. development Edinboro North field	IP not reported 1,240 psi/168 hrs. development Pattison pool New Ireland field	1,500 Mcf AF 1,200 psi/48 hrs. development Edinboro North field	1,000 Mcf AF 1,100 psi/168 hrs. development Edinboro North field	640 Mcf AF 1,075 psi/24 hrs. development Lundys Lane pool Conneaut field	1,100 Mcf AF 1,050 psi/168 hrs. development Swalls pool Orumlin field	1,100 Mcf AF 1,010 psi/120 hrs. development Little Hope pool North East field	4,200 Mcf AF 1,100 psi/48 hrs. development Talcott pool North East field	IP not reported gas development Little Hope pool North East field

COUNTY Permit Number	Erie 049-22747	Erie 049-22752	Erie 049-22817	Erie 049-22918	Erie 049-22919	Erie 049-22982	Erie 049-22983	Erie 049-22991	Erie 049-23034	Erie 049-23039
NAME OF WELL	James Hopkins #3	Douglas Gibbons #3	H. Proctor #2	Wayne Lugaia #2	Cornwell #1	Steff #2	Mayhue #1	Elegger #3	Lois Bacon #1	George Gregor #1
OPERATOR	Kaltesas Oil Company, Inc.	Kaltesas Oil Company, Inc.	Envirogas, Incorporated	C & C Troyer Brothers #82	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.
TOWNSHIP	Venango	Greenfield	Waterford	Waterford	LeBoeuf	Waterford	Waterford	Waterford	Amity	Amity
QUADRANGLE	Wattsburg	Wattsburg	Waterford	Cambridge Spgs., NE	Waterford	Cambridge Spgs., NE	Cambridge Spgs., NE	Cambridge Spgs., NE	Union City	Union City
LATITUDE	3,310 ft. S 42°05'00"	1,330 ft. S 42°07'30"	9,200 ft. S 42°00'00"	14,700 ft. S 41°57'30"	15,100 ft. S 41°55'00"	8,350 ft. S 41°57'30"	8,500 ft. S 41°57'30"	9,000 ft. S 41°57'30"	9,750 ft. S 42°00'00"	2,900 ft. S 41°57'30"
LONGITUDE	8,530 ft. W 79°47'30"	9,800 ft. W 79°45'00"	7,450 ft. W 79°52'30"	2,750 ft. W 80°02'30"	6,700 ft. W 79°55'00"	10,800 ft. W 80°00'00"	9,000 ft. W 80°00'00"	3,800 ft. W 80°02'30"	2,850 ft. W 79°50'00"	3,500 ft. W 79°50'00"
DATE COMPLETED	10-7-83	10-17-83	7-12-83	9-7-83	1-19-84	3-12-84	3-16-84	3-16-84	9-14-83	8-18-83
ELEVATION	1490 GR	1425 GR	1545 GR	1495 GR	1460 GR	1470 GR	1510 GR	1555 GR	1304 GR	1480 GR
LOGS RECEIVED AND LOGGED INTERVALS			COL: 2150-4150 OLL: 2100-4150	COL/CNL: 413-4237 OLL/OLL: 413-4228	COL/CNL: 438-4378 LL: 1036-4376	COL/CNL: 414-4140 OLL: 414-4140		COL/CNL: 422-4264 OLL: 422-4265 INT: 4020-4180	COL/CNL: 401-4039 OLL: 450-4040 INT: 3750-3916	COL/CNL: 2512-4265 3-0 VEL: 2900-4224 INT: 3950-4250
TULLY LIMESTONE	2334-		2448-	2532-	2678-	2486-	2508-	2606-	2222-	2522-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2552-		2676-	2746-	2912-	2704-		2824-	2560-	2758-
ORISKANY SANDSTONE RIDGELEY SANDSTONE			2912-	3018-		2964-	2928-			
SILURIAN-DEVONIAN CARBONATES			2920-	3026-	3102-	2968-		3084-	2810-	2980-
SALINA GROUP LOCKPORT DOLOMITE	2800- 3100-		3004- 3542-	3096- 3590-	3198- 3830-	3030- 3532-	3040- 3524-	3148- 3650-	2872- 3410-	3016- 3638-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3572-		3804- 3856-	3856- 3917-	4038- 4102-	3786- 3844-	3770- 3868-	3902- 3973-	3674- 3716-	3900- 3944-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3588- 3734- 3756-	3507- 3630- 3670-	3890- 3996- 4048-	3939- 4068- 4114-	4140- 4270- 4304-	3868- 3998- 4040-	3896- 4022- 4064-	3994- 4128- 4172-	3770- 3870- 3908-	3968- 4096- 4134-
QUEENSTON FORMATION	3770-	3680-	4056-	4124-	4314-	4048-	4074-	4176-	3918-	4144-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3655-3768	3537-3672	3952-4054	4003-4062	4168-4262	3912-4042	3927-4068	4033-4174	3780-3860	4022-4076
TOTAL DEPTH	3841	3770	4165	4230	4379	4150	4158	4266	4041	4270
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	500 Mcf AF 1,175 psi/72 hrs. development Little Hope pool North East field	IP not reported gas development Little Hope pool North East field	7,000 Mcf AF 1,130 psi/240 hrs. development Waterford pool LeBoeuf field	2,000 Mcf AF 1,100 psi/96 hrs. development Edinboro North field	1,300 Mcf AF 1,030 psi/96 hrs. development New Ireland field	1,500 Mcf AF 1,080 psi/96 hrs. development Swalls pool Oriskany field	1,200 Mcf AF 1,020 psi/96 hrs. development Swalls pool Oriskany field	1,100 Mcf AF 1,085 psi/120 hrs. development Reeds Corners field	450 Mcf AF 1,050 psi/24 hrs. development Alder Run field	150 Mcf AF 970 psi/24 hrs. development Alder Run field

Figure 35. (Continued).

COUNTY Permit Number	Erie 049-23092	Erie 049-23111	Erie 049-23121	Erie 049-23122	Erie 049-23123	Erie 049-23124	Erie 049-23125	Erie 049-23138	Erie 049-23180	Erie 049-23183
NAME OF WELL	Lantz/Leslie #1	Donald Bailey #1	Floyd Newton #1	Gary Gastemire #1	Gary Gastemire #2	S. S. Ardillo #1	C.O. & H.E. McGraw #2	L. B. Zimmer #1	OeBrakeleer #1	Jack G. Baker #2
OPERATOR	U. S. Energy Development Corp.	C & C Troyer Brothers #85	Troyer Gas and Oil Company	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	C & C Troyer Brothers #90	Tetra Energy Group, Ltd.
TOWNSHIP	Venango	Waterford	Waterford	Elk Creek	Elk Creek	Franklin	Elk Creek	Franklin	Mill Village	Franklin
QUADRANGLE	Wattsburg	Waterford	Waterford	Edinboro North	Edinboro North	Albion	Edinboro North	Edinboro North	Miller Station	Albion
LATITUDE	8,250 ft. S 41°02'30"	7,000 ft. S 41°57'30"	10,000 ft. S 41°57'30"	10,000 ft. S 41°55'00"	10,800 ft. S 41°55'00"	9,400 ft. S 41°55'00"	13,900 ft. S 41°55'00"	9,400 ft. S 41°55'00"	800 ft. S 41°52'30"	8,400 ft. S 41°55'00"
LONGITUDE	9,000 ft. W 79°45'00"	2,700 ft. W 79°55'00"	9,800 ft. W 79°57'30"	7,700 ft. W 80°12'30"	9,150 ft. W 80°12'30"	650 ft. W 80°15'00"	7,050 ft. W 80°12'30"	5,900 ft. W 80°12'30"	6,300 ft. W 79°57'30"	3,600 ft. W 80°15'00"
DATE COMPLETED	4-2-84	8-26-83	8-22-83	9-1-83	9-2-83	8-25-83	9-12-83	8-30-83	9-20-83	9-20-83
ELEVATION	1385 GR	1360 GR	1175 GR	1263 GR	1290 GR	1280 GR	1245 GR	1276 GR	1205 GR	1222 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/SNP: 416-4030 OIL/ULL: 416-4030	CNL/COL: 2400-4110		COL/CNL: 2150-3854 GR/IL: 2150-3850 INT: 3660-3800	COL/CNL: 2200-3898 GR/IL: 2200-3893 INT: 3624-3815	COL/CNL: 2170-3828 GR/IL: 2170-3820 3-0 VEL: 2740-3790 INT: 3550-3797		COL/CNL: 2175-3860 GR/IL: 2175-3855 3-0 VEL: 2500-3845 INT: 3550-3805	COL/CNL/GR: 2940-4148 PCL: 3850-4156	COL/CNL: 2090-3815 GR/IL: 2090-3811 3-0 VEL: 2500-3771 INT: 3495-3725
TULLY LIMESTONE	2315-	2382-	2222-	2178-	2214-	2182-	2212-	2196-	2554-	2122-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2546-	2608-	2444-	2376-	2410-	2378-	2408-	2394-	2670-	2320-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	2710-						2562-		2952-	
SILURIAN-DEVONIAN CARBONATES	2756-	2852-	2733-	2690-	2680-	2596-	2674-	2650-		2592-
SALINA GROUP LOCKPORT DOLOMITE	2888- 3404-	2916- 3480-	2900- 3326-	2706- 3256-	2748- 3306-	2708- 3280-	2744- 3260-	2734- 3268-		2660- 3210-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3656- 3706-	3728- 3798-	3528- 3636-	3516- 3558-	3546- 3596-	3520- 3570-	3596-	3524- 3570-	3846-	3470- 3510-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	3742- 3850- 3896-	3833- 3950- 3998-	3663- 3784- 3826-	3600- 3678- 3706-	3612- 3752- 3794-	3604- 3698- 3766-	3624- 3752- 3792-	3596- 3692- 3718-	3892- 4006- 4056-	3546- 3630- 3708-
QUEENSTON FORMATION	3908-	4005-	3838-	3712-	3800-	3772-	3802-	3728-	4063-	3714-
PRODUCING FORMATION		Medina		Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL		3885-3949		3628-3674	3666-3744	3620-3674	3644-3698	3626-3684	3952-3999	3568-3622
TOTAL DEPTH	4026	4121	3950	3867	3899	3826	3870	3868	4157	3816
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	IP not reported development Hasele pool Carter field	1,800 Mcf AF 1,150 Mcf AF development Waterford LaBoeuf field	Not stimulated Dry development Swabs pool Orumlin field	250 Mcf AF 980 psi/24 hrs. development Pageville pool Conneaut field	450 Mcf AF 1,000 psi/24 hrs. development Pageville pool Conneaut field	1,500 Mcf AF 1,010 psi/24 hrs. development Pageville pool Conneaut field	3,500 Mcf AF 1,100 psi/48 hrs. development Pageville pool Conneaut field	2,500 Mcf AF 1,010 psi/48 hrs. development Franklin Center field	1,200 Mcf AF 1,180 psi/48 hrs. development Mill Village field	750 Mcf AF 980 psi/24 hrs. development Pageville pool Conneaut field

COUNTY Permit Number	Erie 049-23184	Erie 049-23185	Erie 049-23206	Erie 049-23207	Erie 049-23208	Erie 049-23221	Erie 049-23222	Erie 049-23278	Erie 049-23284	Erie 049-23569
NAME OF WELL	Martha Headley #1	Francis Surovick #1	Frank Robasky #1	Martin Hanas #1	Ralph G. Soltis #1	Thomas McCammon #1	Gary Gastemire #3	David Korn #1	Burdick-Janosik #1	Waterhouse #1
OPERATOR	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Tetra Energy Group, Ltd.	Kaltas Oil Company, Inc.	C & C Troyer Brothers #91	Vineyard Oil & Gas Company
TOWNSHIP	Elk Creek	Elk Creek	Elk Creek	Elk Creek	Elk Creek	Elk Creek	Elk Creek	Vanango	Waterford	Summit
QUADRANGLE	Albion	Albion	Albion	Albion	Albion	Albion	Edinboro North	Waterford	Waterford	Erie South
LATITUDE	11,200 ft. S 41°55'00"	10,000 ft. S 41°55'00"	9,500 ft. S 41°55'00"	9,400 ft. S 41°55'00"	9,400 ft. S 41°55'00"	12,850 ft. S 41°55'00"	9,500 ft. S 41°55'00"	3,800 ft. S 42°02'30"	7,900 ft. S 41°57'30"	8,400 ft. S 42°02'30"
LONGITUDE	3,400 ft. W 80°15'00"	4,400 ft. W 80°15'00"	5,950 ft. W 80°15'00"	2,800 ft. W 80°17'30"	8,100 ft. W 80°15'00"	6,600 ft. W 80°15'00"	9,850 ft. W 80°12'30"	6,800 ft. W 79°45'00"	10,400 ft. W 79°57'30"	5,650 ft. W 80°00'00"
DATE COMPLETED	9-30-83	9-24-83	10-7-83	10-4-83	10-6-83	10-12-83	9-28-83	9-25-84	10-4-83	3-30-84
ELEVATION	1235 GR	1218 GR	1170 GR	1159 GR	1202 GR	1200 GR	1290 GR	1430 GR	1175 GR	1290 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL/CNL: 2100-3870 GR/LL: 2058-3864 3-O VEL: 0-3855 INT: 3580-3751	CDL/CNL: 2059-3828 OLL: 2058-3818 3-O VEL: 2700-3792 INT: 3510-3739	CDL/CNL: 2010-3790 GR/LL: 3486-3670 INT: 3486-3704	CDL/CNL: 2000-3703 GR/LL: 2000-3698 INT: 3400-3704	CDL/CNL: 2040-3766 GR/LL: 2040-3701 3-O VEL: 2500-3734 INT: 3510-3702	CDL/CNL: 2007-3803 LL: 2009-3818 3-O VEL: 2750-3896 INT: 3564-3820	CDL/CNL: 2175-3910 GR/LL: 2175-3918 3-O VEL: 2750-3896 INT: 3564-3820			
TULLY LIMESTONE	2160-	2134-	2073-	2042-	2096-	2136-	2210-	2376-	2240-	2007-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2356-	2332-	2268-	2232-	2290-	2320-	2408-	2607-	2555-	2236-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	2610-							2750-		
SILURIAN-DEVONIAN CARBONATES	2618-	2594-	2536-	2484-	2550-	2610-	2664-	2828-	2760-	2436-
SALINA GROUP LOCKPORT DOLOMITE	2684- 3248-	2666- 3230-	2606- 3170-	2520- 3130-	2684- 3178-	2652- 3220-	2736- 3282-	2944-		2601- 3096-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3494- 3546-	3470- 3522-	3412- 3458-	3378- 3430-	3438- 3484-	3462- 3512-	3548- 3596-	3616- 3700-	3502-	3304- 3408-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	3592- 3730- 3746-	3548- 3676- 3718-	3494- 3576- 3658-	3456- 3546- 3624-	3510- 3634- 3680-	3558- 3672- 3710-	3620- 3714- 3794-	3723- 3850- 3881-	3572- 3674- 3750-	3436- 3550- 3582-
QUEENSTON FORMATION	3752-	3726-	3664-	3630-	3686-	3716-	3800-	3886-	3756-	3592-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3610-3658	3586-3638	3528-3572	3482-3540	3544-3632	3574-3626	3618-3702	3775-3895	3629-3670	3448-3587
TOTAL DEPTH	3876	3850	3775	3712	3775	3822	3931	3941	3795	3675
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,200 Mcf AF 1,000 psi/24 hrs. development Pageville pool Conneaut field	350 Mcf AF 950 psi/24 hrs. development Pageville pool Conneaut field	450 Mcf AF 980 psi/24 hrs. development Pageville pool Conneaut field	650 Mcf AF 1,000 psi/24 hrs. development Lundys Lane pool Conneaut field	3,000 Mcf AF 1,000 psi/24 hrs. development Lundys Lane pool Conneaut field	1,000 Mcf AF 1,000 psi/24 hrs. development Pageville pool Conneaut field	400 Mcf AF 980 psi/24 hrs. development Pageville pool Conneaut field	800 Mcf AF 920 psi/72 hrs. development Carter Hill field	3,000 Mcf AF 1,150 psi/72 hrs. development Swails pool Bramlin field	500 Mcf AF 1,025 psi/168 hrs. development Talcott pool Erie field

Figure 35. (Continued).

COUNTY Permit Number	Erie 049-23638	Erie 049-23734	Erie 049-23855	Erie 049-23861	Erie 049-23866	Erie 049-23889	Erie 049-23956	Erie 049-23968	Erie 049-23973	Erie 049-23974
NAME OF WELL	Theodore Seymour #1	L. Morton #3	W. Drloski #1	Margaret Goodell #1	W. Drloski #2	Aloysius Rinderle #2	Walter Bam #1	W. Zaborowski #3	Robert Turner #1	Robert Turner #2
OPERATOR	N.E.A. Cross Company	Envirogas, Incorporated	Envirogas, Incorporated	N.E.A. Cross Company	Envirogas, Incorporated	Mitch-Weil Energy, Inc.	N.E.A. Cross Company	Kaltaas Oil Company, Inc.	N.E.A. Cross Company	N.E.A. Cross Company
TOWNSHIP	Waterford	Wayne	Greenfield	Edinboro	Greenfield	Waterford	Union City	Greenfield	LeBoeuf	LeBoeuf
QUADRANGLE	Waterford	Union City	Wattsburg	Cambridge Spgs., NE	Wattsburg	Waterford	Union City	Wattsburg	Cambridge Springs	Cambridge Springs
LATITUDE	5,700 ft. S 41°57' 30"	3,700 ft. S 42°00' 00"	6,900 ft. S 42°07' 30"	12,100 ft. S 41°55' 00"	8,300 ft. S 42°07' 30"	7,300 ft. S 41°57' 30"	2,200 ft. S 41°55' 00"	13,500 ft. S 42°07' 30"	6,400 ft. S 41°52' 30"	6,550 ft. S 41°52' 30"
LONGITUDE	9,400 ft. W 79°57' 30"	300 ft. W 79°45' 00"	7,300 ft. W 79°45' 00"	10,400 ft. W 80°05' 00"	6,200 ft. W 79°45' 00"	11,300 ft. W 79°55' 00"	6,650 ft. W 79°50' 00"	9,190 ft. W 79°45' 00"	300 ft. W 80°00' 00"	2,100 ft. W 80°00' 00"
DATE COMPLETED	8-18-84	5-17-84	6-5-84	9-24-84	5-2-84	8-31-84	6-10-84	6-22-84	8-31-84	9-4-84
ELEVATION	1180 GR	1640 GR	1405 GR	1250 GR	1400 GR	1210 GR	1380 GR	1630 GR	1250 GR	1410 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL: 1700-3754			COL: 2050-4042		COL/CNL: 2000-3836	COL: 2543-4318		COL: 2200-4220	COL: 2090-4356
TULLY LIMESTONE	2060-	2651-	2174-	2308-	2186-	2126-	2556-	2480-	2494-	2654-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2282-	2888-	2402-	2520-	2415-	2350-	2790-	2709-	2710-	2872-
ORISKANY SANDSTONE RIDGELEY SANDSTONE			2643-	2780-	2650-	2608-		2884-	2944-	
SILURIAN-DEVONIAN CARBONATES	2560-	3112-	2656-	2783-	2659-	2617-	3016-		2960-	3072-
SALINA GROUP LOCKPORT DOLOMITE	2662- 3168-	3205- 3722-	2742- 3102-	2850- 3414-	2748- 3124-	2696- 3252-	3086- 3670-	2912- 3406-	3008- 3580-	3182- 3816-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3428- 3479-	3980- 4052-	3370- 3436-	3670- 3722-	3368- 3438-	3510- 3564-	3928- 3994-	3716-	3838- 3904-	4021- 4074-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3513- 3630- 3672-	4082- 4205- 4240-	3471- 3580- 3614-	3758- 3886- 3922-	3472- 3583- 3614-	3600- 3713- 3758-	4032- 4134- 4190-	3747- 3870- 3895-	3828- 4066- 4106-	4134- 4232- 4278-
QUEENSTON FORMATION	3680-	4256-	3630-	3930-	3632-	3767-	4203-	3910-	4116-	4287-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3574-3608	4124-4248	3500-3620	3798-3835	3503-3621	3624-3704	4062-4133	3805-3908	3980-4019	4145-4186
TOTAL DEPTH	3770	4328	3739	4046	3731	3847	4313	3977	4224	4360
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	700 Mcf AF 1,020 psi/48 hrs. development Swails Drumlin field	1,000 Mcf AF 1,130 psi/240 hrs. development Carter Hill field	500 Mcf AF 1,100 psi/240 hrs. development Bull Reservoir pool North East field	500 Mcf AF 1,060 psi/48 hrs. development Edinboro field	300 Mcf AF 1,160 psi/240 hrs. development Bull Reservoir pool North East field	1,500 Mcf AF 1,075 psi/48 hrs. development Watford LeBoeuf field	900 Mcf AF 1,130 psi/48 hrs. development Barns Union City field	500 Mcf AF 1,100 psi/48 hrs. development Bull Reservoir pool North East field	7,400 Mcf AF 1,200 psi/48 hrs. development Mill Village field	10,800 Mcf AF 1,200 psi/48 hrs. development Mill Village field

COUNTY Permit Number	Erie 049-23986	Erie 049-23991	Erie 049-24010	Erie 049-24052	Erie 049-24057	Erie 049-24085	Erie 049-24087	Erie 049-24136	Erie 049-24149	Erie 049-24181
NAME OF WELL	Duane Wade #1	Salmon/Werner #1	Richard Reichbaum #1	Michael Strucker #1	Thomas Mountain #3	William Lynch #1	Wayne Lugalla #2	Erie County Sportsmen League #1	Charles Rockwood #1	Mervin Troyer #1
OPERATOR	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	Vineyard Oil & Gas Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company	N.E.A. Cross Company
TOWNSHIP	Waterford	Waterford	Union	Waterford	Venango	Waterford	Waterford	Waterford	Union City	Union
QUADRANGLE	Waterford	Waterford	Union City	Waterford	Wattsburg	Cambridge Spgs., NE	Cambridge Spgs., NE	Cambridge Spgs., NE	Union City	Waterford
LATITUDE	6,760 ft. S 41°57'30"	9,400 ft. S 41°57'30"	4,500 ft. S 41°57'00"	6,400 ft. S 41°57'30"	14,200 ft. S 42°05'00"	750 ft. S 41°57'30"	300 ft. S 41°55'00"	7,400 ft. S 42°00'00"	4,000 ft. S 41°55'00"	4,300 ft. S 41°55'00"
LONGITUDE	8,500 ft. W 79°55'00"	10,900 ft. W 79°57'30"	11,250 ft. W 79°50'00"	9,700 ft. W 79°55'00"	2,350 ft. W 79°50'00"	750 ft. W 80°02'30"	2,100 ft. W 80°02'30"	7,700 ft. W 80°00'00"	6,700 ft. W 79°50'00"	1,600 ft. W 79°52'30"
DATE COMPLETED	8-15-84	9-8-84	8-21-84	8-21-84	10-12-84	8-10-84	9-7-84	9-6-84	9-29-84	10-6-84
ELEVATION	1330 GR	1240 GR	1290 GR	1310 GR	1320 GR	1360 GR	1450 GR	1330 GR	1290 GR	1220 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL: 2000-4037		COL: 2400-4178	COL: 1972-3994	COL/CNL: 446-3792 OLL: 446-3794 INT: 3530-3694	COL: 2311-3964	COL: 2500-4268	COL: 2100-3862	COL: 2200-4208	COL/CNL: 2400-4134
TULLY LIMESTONE	2290-	2276-	2462-	2250-	2154-	2307-	2567-	2134-	2482-	2426-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2510-	2504-	2694-	2472-	2382-	2522-	2786-	2352-	2716-	2652-
ORISKANY SANDSTONE RIDGELEY SANDSTONE				2716-			3082-	2548-	2946-	
SILURIAN-DEVONIAN CARBONATES	2760-		2922-	2734-	2610-	2774-	3092-	2560-	2950-	2880-
SALINA GROUP LOCKPORT DOLOMITE	2850- 3400-		2992- 3563-	2818- 3376-	2660- 3188-	2852- 3344-	3150- 3642-	2726- 3218-	3012- 3582-	2953- 3492-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3650- 3718-	3650-	3812- 3882-	3623- 3684-	3440- 3488-	3604- 3664-	3903- 3964-	3496- 3544-	3835- 3904-	3742- 3812-
GRIMSBY FORMATION CAROL HEAD SHALE WHIRLPOOL SANDSTONE	3742- 3660- 3916-	3734- 3660- 3884-	3918- 4038- 4078-	3718- 3840- 3880-	3538- 3638- 3670-	3686- 3806- 3860-	3986- 4114- 4158-	3566- 3690- 3736-	3942- 4062- 4100-	3850- 3975- 4009-
QUEENSTON FORMATION	3925-	3996-	4050-	3888-	3686-	3688-	4166-	3744-	4112-	4020-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3816-3857	3767-3786	3974-4009	3754-3824	3587-3638	3761-3789	4028-4061	3641-3651	4000-4055	3933-3968
TOTAL DEPTH	4042	4024	4190	4010	3810	3988	4307	3873	4240	4138
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,600 Mcf AF 1,000 psi/48 hrs. development Waterford LeBoeuf field	1,300 Mcf AF 660 psi/48 hrs development Swails Orumlin field	1,300 Mcf AF 1,200 psi/48 hrs. development Emmons pool Union City field	1,800 Mcf AF 1,020 psi/48 hrs. development Waterford LeBoeuf field	500 Mcf AF 925 psi/48 hrs. development Bailey Brook pool North East field	7,000 Mcf AF 1,100 psi/48 hrs. development Swails Orumlin field	50 Mcf AF 1,120 psi/48 hrs. development Edinboro field	2,300 Mcf AF 1,040 psi/48 hrs. development Swails Orumlin field	5,000 Mcf AF 1,150 psi/48 hrs. development Emmons pool Union City field	300 Mcf AF 1,100 psi/48 hrs. development Emmons pool Union City field

Figure 35. (Continued).

COUNTY Permit Number	Erie 049-24183	Erie 049-24207	Erie 049-24263-0	Erie 049-24318	Erie 049-24451	Erie 049-24453	Erie 049-24468	Erie 049-24517	Erie 049-24527	Erie 049-24544-0
NAME OF WELL	William Loper #2	R. Szymanski #1	Paul Otto #1	Norbert Cross #1	Oavid Bensink #1	Alton Young #1	Erie Municipal Airport #5	Swany #2	Oavid Tomczak #1	Erie Municipal Airport #6
OPERATOR	N.E.A. Cross Company	Envirosas, Incorporated	Mid American Natural Resources	N.E.A. Cross Company	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	N.E.A. Cross Company	N.E.A. Cross Company	Vineyard Oil & Gas Company
TOWNSHIP	Waterford	Venango	Millcreek	Waterford	Venango	Venango	Millcreek	Waterford	Greene	Millcreek
QUADRANGLE	Cambridge Spgs., NE	Wattsburg	Swanville	Cambridge Spgs., NE	Wattsburg	Wattsburg	Swanville	Cambridge Spgs., NE	Hammett	Swanville
LATITUDE	3,300 ft. S 41°57'30"	7,150 ft. S 42°05'00"	2,550 ft. S 42°05'00"	4,400 ft. S 42°00'00"	8,500 ft. S 42°02'30"	100 ft. S 42°02'30"	3,500 ft. S 42°05'00"	1,800 ft. S 42°00'00"	13,250 ft. S 42°05'00"	14,100 ft. S 42°05'00"
LONGITUDE	2,800 ft. W 80°02'30"	6,700 ft. W 79°45'00"	3,100 ft. W 80°10'00"	3,700 ft. W 80°00'00"	5,700 ft. W 79°45'00"	5,100 ft. W 79°47'30"	7,700 ft. W 80°10'00"	4,400 ft. W 80°00'00"	9,000 ft. W 79°57'00"	2,550 ft. W 80°10'00"
DATE COMPLETED	10-15-84	10-25-84	4-17-88	12-17-84	3-4-85	3-8-85	4-18-85	9-6-85	8-21-85	6-20-86
ELEVATION	1450 GR	1692 GR	740 GR	1370 GR	1340 GR	1430 GR	730 GR	1360 GR	1440 GR	730 GR
LOGS RECEIVED AND LOGGED INTERVALS	OIL/OLL: 2393-4096		COL/CNL: 1300-2865	COL: 1800-3873	COL/CNL: 490-3936 LL: 1526-3932	COL/CNL: 445-3897 OLL: 1900-3899 PCL: 3703-3820	COL/CNL: 477-2869 LL: 1200-2868 PCL: 2647-2785	COL/T: 2100-3847		COL/CNL: 1728-2862 OLL: 1728-2850 PCL: 2482-2844
TULLY LIMESTONE	2430-	2569-	1315-	2152-	2232-	2304-	1316-	2146-	2110-	1292-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2650-	2798-	1522-	2370-	2464-	2534-	1522-	2374-	2181-	1498-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	2912-							2662-	2593-	1700-
SILURIAN-DEVONIAN CARBONATES	2918-	3032-	1774-	2684-	2716-	2706-	1826-	2676-		1730-
SALINA GROUP LOCKPORT DOLOMITE	2988- 3498-	3141- 3532-	1892- 2594-	2768- 3282-	2802- 3370-	2828- 3344-	1894- 2298-	2754- 3216-		1860- 2280-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3746- 3796-	3787- 3850-	2546- 2606-	3495- 3558-	3618- 3658-	3578- 3626-	2544- 2594-	3478- 3532-		2522- 2574-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	3818- 3940- 3992-	3892- 3990- 4030-	2636- 2750- 2790-	3606- 3678- 3748-	3694- 3806- 3844-	3658- 3776- 3810-	2620- 2752- 2782-	3552- 3690- 3726-		2604- 2715- 2760-
QUEENSTON FORMATION	4000-	4049-	2800-	3756-	3856-	3824-	2788-	3732-		2766-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Oriskany	Medina
PRODUCING INTERVAL	3876-3914	4036-4045	2857-2704	3628-3668	3730-3847	3703-3820	2647-2785	3622-3634	2593-	2625-2765
TOTAL DEPTH	4098	4129	2856	3880	3940	3915	2885	3853	2593	2870
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Oriskany	Queenston
RESULTS	1,200 Mcf AF 1,100 Mcf AF development Swails Drumlin field	900 Mcf AF 1,150 Mcf AF development Bailey Brook pool North East field	500 Mcf AF 750 Mcf AF development Charter Oaks pool Erie field	400 Mcf AF 1,100 Mcf AF development Swails Orumlin field	1,200 Mcf AF 1,050 Mcf AF development Carter Hill field	1,200 Mcf AF 1,120 Mcf AF development Bailey Brook pool North East field	1,200 Mcf AF 860 Mcf AF development Charter Oaks pool Erie field	1,500 Mcf AF 980 Mcf AF development Swails Orumlin field	3,000 Mcf AF 600 Mcf AF development Bartolic pool Erie field	650 Mcf AF 870 Mcf AF development Charter Oaks pool Erie field

COUNTY Permit Number	Erie 049-24609	Erie 049-24637	Erie 049-24702	Erie 049-24753	Erie 049-24763	Erie 049-24768	Erie 049-24792	Erie 049-24803	Erie 049-24804	Erie 049-24810
NAME OF WELL	Thomas W. Farak Unit #1	Masterweld #2	Stoffan #2	Paul Mickla #3	T. Griffin #1	Rolland Chase #2	Norman Yost #1	Jennes #2	Medved #1-3	Anthony Pastore #1
OPERATOR	NRM Petroleum Corporation	N.E.A. Cross Company	Vineyard Oil & Gas Company	Kaltas Oil Company, Inc.	King Oil & Gas Corporation	King Oil & Gas Corporation	Vineyard Oil & Gas Company	Northwest Natural Gas Company	Northwest Natural Gas Company	Mid American Natural Resources
TOWNSHIP	Greene	Millcreek	Venango	LeBoeuf	Venango	Concord	Venango	Conneaut	Elk Creek	McKean
QUADRANGLE	Hammett	Swanville	Wattsburg	Cambridge Springs	Wattsburg	Corry	Wattsburg	Conneautville	Conneautville	Erie South
LATITUDE	11,900 ft. S 42°05'00"	750 ft. S 42°05'00"	11,900 ft. S 42°05'00"	5,690 ft. S 41°52'30"	7,600 ft. S 42°02'30"	9,950 ft. S 41°55'00"	7,100 ft. S 42°02'30"	7,000 ft. S 41°52'30"	50 ft. S 41°52'30"	11,300 ft. S 42°02'30"
LONGITUDE	9,050 ft. W 79°57'30"	500 ft. W 80°10'00"	6,590 ft. W 79°47'30"	6,110 ft. W 80°00'00"	8,750 ft. W 79°50'00"	2,575 ft. W 79°40'00"	1,590 ft. W 79°47'30"	5,275 ft. W 80°20'00"	1,300 ft. W 80°20'00"	1,100 ft. W 80°05'00"
DATE COMPLETED	8-28-85	11-10-85	10-30-86	11-23-86	8-2-88	12-29-86	10-18-86	8-7-87	8-7-87	11-20-87
ELEVATION	1436 GR	740 GR	1435 GR	1440 GR	1567 GR	1665 GR	1441 GR	1100 GR	1020 GR	1230 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/GR: 443-2000	COL/CNL: 478-3898 OLL: 478-3884 INT: 3648-3810 PCL: 3590-3877	COL/CNL: 478-3898 OLL: 478-3884 INT: 3648-3810 PCL: 3590-3877		COL/CNL/GR: 0-4106 OLL: 1792-4106	COL/CNL: 506-4840 OLL: 2246-4826 INT: 4538-4711	COL/CNL: 483-4017 OLL: 482-4005 INT: 3750-3920 PCL: 3700-4006			COL/CNL/T: 1900-3656
TULLY LIMESTONE	2110-	1315-	2304-	2654-	2430-	3098-	2392-	2090-	1940-	1973-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2334-	1522-	2534-	2874-	2664-	3358-	2620-	2266-	2120-	2192-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	2532-					3538-				2454-
SILURIAN-DEVONIAN CARBONATES										
SALINA GROUP LOCKPORT DOLOMITE										
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		1783- 2600-	3550- 3616-	4090-	3744- 3800-	4436- 4496-	3652- 3726-	3354-	3234-	3317- 3362-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE		2640- 2750- 2786-	3650- 3739- 3796-	4142- 4238- 4284-	3834- 3924- 3968-	4540- 4661- 4696-	3760- 3834- 3904-	3478-	3362-	3398- 3517- 3556-
QUEENSTON FORMATION		2796-	3806-	4294-	3998-	4708-	3916-			3560-
PRODUCING FORMATION	Oriskany	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	2582-	2684-2706	3691-3804	4171-4292	3903-3992	4567-4707	3785-3912	3519-3572	3413-3465	3432-3514
TOTAL DEPTH	2592	2796	3905	4427	4120	4811	4025	3572	3553	3660
DEEPEST FORMATION REACHED	Oriskany	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Medina	Medina	Queenston
RESULTS	1,750 Mcf AF 640 psi/72 hrs. development Bartolic pool field	200 Mcf AF 800 psi/48 hrs. development Charter Oaks pool field	1,500 Mcf AF 1,150 psi/168 hrs. development Bailey Brook pool field	989 Mcf AF 1,200 psi/48 hrs. development Edinboro North field	IP not reported development Gennee Phillipsville field	250 Mcf AF 1,180 psi/72 hrs. development Harbor Ridge pool field	300 Mcf AF 1,050 psi/168 hrs. development Carter Hill field	1,100 Mcf AF 780 psi/48 hrs. development Lundys Lane pool field	1,000 Mcf AF 840 psi/48 hrs. development Lundys Lane pool field	500 Mcf AF 950 psi/48 hrs. development Ounn Valley pool field

Figure 35. (Continued).

COUNTY Permit Number	Erie 049-24845	Erie 049-24849	Erie 049-24854-P	Erie 049-24871	Erie 049-24872	Erie 049-24873	Erie 049-24874	Erie 049-24876	Erie 049-24879	Erie 049-24881
NAME OF WELL	Paul Smith #3	Waterford Baptist Church #1	Esk #1	Greenfield Township #1	William P. Rehm #1	Roger Diemeyer #2	Paul Henkel #2	O. F. Biletinkoff #1	Ronald Meabon #8	Goodban #1
OPERATOR	Mid American Natural Resources	Troyer Gas & Oil Company #T-41	N.E.A. Cross Company	Kaltaas Oil Company, Inc.	Kaltaas Oil Company, Inc.	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	Vineyard Oil & Gas Company	N.E.A. Cross Company
TOWNSHIP	Venango	Waterford	McKean	Greenfield	Greenfield	Venango	Venango	Venango	Venango	McKean
QUADRANGLE	Wattsburg	Waterford	Cambridge Spgs., NE	Wattsburg	Hammett	Wattsburg	Wattsburg	Wattsburg	Wattsburg	Erie South
LATITUDE	12,400 ft. S 42°02'30"	4,900 ft. S 41°57'30"	3,500 ft. S 42°00'00"	9,540 ft. S 42°07'30"	4,490 ft. S 42°07'30"	4,330 ft. S 42°02'30"	5,610 ft. S 42°02'30"	6,600 ft. S 42°02'30"	6,830 ft. S 42°02'30"	11,900 ft. S 42°02'30"
LONGITUDE	11,200 ft. W 79°47'30"	5,400 ft. W 79°57'30"	5,900 ft. W 80°02'30"	6,590 ft. W 79°05'00"	790 ft. W 79°52'30"	2,810 ft. W 79°50'00"	2,910 ft. W 79°50'00"	10,500 ft. W 79°47'30"	8,600 ft. W 79°47'30"	1,750 ft. W 80°05'00"
DATE COMPLETED	3-26-87	11-6-87	10-14-87	8-18-87	8-25-87	5-12-87	5-22-87	7-16-87	7-17-87	7-22-87
ELEVATION	1350 GR	1225 GR	1260 GR	1476 GR	1485 GR	1356 GR	1420 GR	1311 GR	1300 GR	1125 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 2200-3948	CDL/CNL: 2100-3799				COL/CNL: 0-3856 OLL: 478-3855 PCL: 3560-3817	COL/CNL: 487-3922 LL: 487-3922 PCL: 3640-3916	COL/CNL/GR: 0-3790 OLL: 1078-3790	CNL/GR: 0-2590 OLL/GR: 2393-2610	COL/CNL: 1782-3504
TULLY LIMESTONE	2282-	2116-	2014-	2285-	2143-	2244-	2320-	2257-	2288-	1832-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2510-	2346-	2234-	2517-	2377-	2466-	2540-	2488-	2521-	2050-
ORISKANY SANDSTONE RIDGELEY SANDSTONE						2690-	2704-			2312-
SILURIAN-DEVONIAN CARBONATES	2746-	2622-				2700-	2770-	2712-		2324-
SALINA GROUP LOCKPORT DOLOMITE	2806- 3350-	2840- 3246-		3058- 3224-	2947- 3106-	2744- 3264-	2846- 3340-	2786- 3280-		2414- 2962-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3580- 3651-	3505- 3565-	3404-	3553-	3425-	3540- 3576-	3618- 3654-	3526- 3576-		3152- 3220-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	3686- 3780- 3834-	3585- 3710- 3757-	3434- 3530- 3596-	3594- 3720-	3459- 3549- 3597-	3610- 3724- 3760-	3690- 3794- 3840-	3624- 3724- 3766-		3260- 3366- 3408-
QUEENSTON FORMATION	3848-	3764-	3606-	3732-	3607-	3774-	3850-	3784-		3416-
PRODUCING FORMATION	Medina	Medina		Medina	Medina	Medina	Medina	Medina	Dnondaga Bois Blanc	Medina
PRODUCING INTERVAL	3666-3772	3638-3706		3607-3676	3502-3605	3649-3774	3720-3848	2575-2644	2731-2726	3314-3324
TOTAL DEPTH	3950	3799	3746	3799	3690	3870	3938	3795	2771	3533
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	100 Mcf AP 600 psi/48 hrs. development Wattsburg pool North East field	200 Mcf AP 900 psi/192 hrs. development Waterford LeBoeuf field	Plugged and abandoned development Swails Orumlin field	100 Mcf AP 840 psi/36 hrs. development Bull Reservoir pool North East field	500 Mcf AP 850 psi/36 hrs. development Hornby North East field	1,500 Mcf AP 1,000 psi/48 hrs. development Wattsburg pool North East field	1,500 Mcf AP 1,500 psi/48 hrs. development Wattsburg pool North East field	1,500 Mcf AP 1,500 psi/48 hrs. development Wattsburg pool North East field	100 Mcf AP 100 psi/48 hrs. development Meabon pool North East field	650 Mcf AP 1,100 psi/48 hrs. development Ounn Valley pool Erie field

COUNTY Permit Number	Erie 049-24883	Erie 049-24886	Erie 049-24888	Erie 049-24889	Erie 049-24892-P	Erie 049-24894	Erie 049-24895	Erie 049-24897	Erie 049-24899	Erie 049-24900	
NAME OF WELL	Weir #1	Van Tassel Unit #1	Robert & Linda Craker #2	Weinheimer #1	Eck #2	Venango Township #1	Lyman Austin #2	Oavis Gifford #2	Anthony N. Gomo #1	Amos K. Flint #4	
OPERATOR	N.E.A. Cross Company	King Oil & Gas Corp.	Envirogas, Incorporated	N.E.A. Cross Company	N.E.A. Cross Company	Vineyard Oil & Gas Company	Envirogas, Incorporated	Envirogas, Incorporated	Old Mountain Gas Company, Inc.	James Drilling Corporation	
TOWNSHIP	McKean	Concord	Wayne	McKean	McKean	Venango	Venango	Venango	Waterford	Conneaut	
QUADRANGLE	Cambridge Spgs., NE	Columbus	Corry	Cambridge Spgs., NE	Cambridge Spgs., NE	Wattsburg	Wattsburg	Wattsburg	Cambridge Spgs., NE	Beaver Center	
LATITUDE	50 ft. S 42°00'00"	5,850 ft. S 41°55'00"	8,300 ft. S 42°00'00"	6,250 ft. S 42°00'00"	3,700 ft. S 42°00'00"	2,425 ft. S 42°02'30"	13,300 ft. S 42°05'00"	8,360 ft. S 42°05'00"	3,550 ft. S 42°00'00"	7,400 ft. S 41°52'30"	
LONGITUDE	5,900 ft. W 80°05'00"	9,210 ft. W 79°35'00"	8,800 ft. W 79°40'00"	3,450 ft. W 80°00'00"	4,500 ft. W 80°02'30"	7,600 ft. W 79°47'30"	4,700 ft. W 79°45'00"	3,630 ft. W 79°45'00"	8,750 ft. W 80°00'00"	8,210 ft. W 80°22'30"	
DATE COMPLETED	9-29-87	10-16-87	10-28-87	10-15-87	10-7-87	2-10-88	10-4-87	10-12-87	2-16-88	10-30-87	
ELEVATION	1220 GR	1565 GR	1860 GR	1250 GR	1220 GR	1330 GR	1585 GR	1712 GR	1490 GR	864 GR	
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL/GR: 300-3658 OLL: 2900-4688 PCL: 4300-4695	COL/CNL: 2900-4710 OLL: 2900-4688 PCL: 4300-4695	COL/CNL: 0-4642 GO/GR: 0-4642	COL/CNL: 2000-3714		COL/CNL: 472-3845 OLL: 2100-3833	COL: 388-4104 OLL: 2104-4090	COL: 390-4190 OLL: 2200-4175	COL/CNL: 2200-3848	COL: 200-3462 GR: 3150-3430 GO: 3150-3656	
TULLY LIMESTONE		2974-	2972-	2090-	1981-	2236-	2468-	2590-	2258-		
ONONDAGA LIMESTONE HUNTERSVILLE CHERT		3250-	3220-	2262-	2200-	2466-	2700-	2822-	2480-	1996-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE		2457-				2640-			2734-		
SILURIAN-DEVONIAN CARBONATES		2464-	3424-	2512-		2650-	2886-	3008-	2752-	2266-	
SALINA GROUP LOCKPORT DOLOMITE		3500- 4100-	3494- 4060-	3124-		2725- 3250-	3000- 3520-	3116- 3592-	2838- 3334-	2346- 2880-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		4356- 4420-	4320- 4370-	3388- 3444-	3368-	3500- 3536-	3758- 3806-	3828- 3880-	3592- 3648-	3142- 3188-	
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE		4442- 4588- 4623-	4412- 4526- 4560-	3484- 3510- 3636-	3400- 3510- 3560-	3567- 3680- 3720-	3840- 3950- 3990-	3910- 4028- 4064-	3662- 3764-	3212- 3396- 3393-	
QUEENSTON FORMATION		4634-	4574-	3648-	3569-	3732-	4006-	4080-		3396-	
PRODUCING FORMATION		Medina	Medina	Medina		Medina	Medina	Medina	Medina	Medina	
PRODUCING INTERVAL		4504-4625	4463-4570	3506-3551		3603-3730	3996-4003	4068-4076	3709-3761	3254-3338	
TOTAL DEPTH		4736	4661	3721	3683	3849	4108	4194	3848	3460	
DEEPEST FORMATION REACHED		Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Cabot Head	Queenston	
RESULTS	300 Mcf AF 1,050 psi/48 hrs. development Orrin Valley pool Erie field	800 Mcf AF 1,250 psi/48 hrs. development Stewart Run pool Concord field	3,000 Mcf AF 1,170 psi/24 hrs. development Spencer Creek pool Corry field	1,500 Mcf AF 1,000 psi/48 hrs. development Swails Orumlin field	Plugged and abandoned development Swails Orumlin field	1,500 Mcf AF 1,100 psi/96 hrs. development Bailey Brook pool North East field	1,500 Mcf AF 1,100 psi/96 hrs. development Bailey Brook pool North East field	750 Mcf AF 440 psi/24 hrs. development Bailey Brook pool North East field	500 Mcf AF 1,140 psi/72 hrs. development Bailey Brook pool North East field	186 Mcf AF 980 psi/72 hrs. development Swails Orumlin field	250 Mcf AF Show of oil development Business- Lexington pool Conneaut field

Figure 35. (Continued).

COUNTY	Permit Number	Erie 049-24901	Erie 049-24902	Erie 049-24904	Erie 049-24905	Erie 049-24906	Erie 049-24907	Erie 049-24908	Erie 049-24909	Erie 049-24910	Erie 049-24911
NAME OF WELL	Amos K. Flint #5	Larry Kalika #3	Wilton Gabriel #2	Wilton Gabriel #1	John Lentz #1	Elizabeth Gabriel #1	F. Groenendaal #4	Thomas LaBowski #1	John Kalika #1	Milton Vogel #1	
OPERATOR	James Drilling Corporation	Envirogas, Incorporated	Mid American Natural Resources	Mid American Natural Resources	Mid American Natural Resources	Mid American Natural Resources	Mid American Natural Resources	Envirogas, Incorporated	Envirogas, Incorporated	Mid American Natural Resources	
TOWNSHIP	Conneaut	Wayne	Greenfield	Greenfield	Greenfield	Wattsburg	Venango	McKean	Wayne	Wayne	Amity
QUADRANGLE	Beaver Center	Corry	Wattsburg	Wattsburg	Wattsburg	Wattsburg	Wattsburg	Erie South	Corry	Corry	Waterford
LATITUDE	9,000 ft. S 41°52'30"	9,650 ft. S 42°00'00"	12,500 ft. S 42°07'30"	11,450 ft. S 42°07'30"	13,800 ft. S 42°07'30"	7,450 ft. S 42°05'00"	13,625 ft. S 42°02'30"	8,730 ft. S 42°00'00"	7,180 ft. S 42°00'00"	825 ft. S 42°00'00"	
LONGITUDE	8,350 ft. W 80°22'30"	5,800 ft. W 79°40'00"	6,750 ft. W 79°45'00"	5,700 ft. W 79°45'00"	7,800 ft. W 79°45'00"	8,100 ft. W 79°45'00"	600 ft. W 80°05'00"	10,185 ft. W 79°40'00"	7,600 ft. W 79°40'00"	175 ft. W 79°52'30"	
DATE COMPLETED	10-26-87	1-7-88	2-9-88	12-7-87	12-14-87	12-31-87	12-4-87	12-16-87	12-9-87	2-26-88	
ELEVATION	869 GR	1820 GR	1580 GR	1530 GR	1620 GR	1670 GR	1120 GR	1855 GR	1820 GR	1490 GR	
LOGS RECEIVED AND LOGGED INTERVALS	COL: 250-3485 GR: 3160-3461 GD: 3150-3470	COL: 515-4602 OLL: 2600-4590	INT: 0-4007	GD: 2350-3923	COL/CNL: 2400-3963 INT: 2400-3963	COL/CNL: 2550-4143	COL: 1793-3496	COL: 524-4653 OLL: 2650-4640	COL: 524-4628 OLL: 2640-4616	COL/CNL: 0-4141	
TULLY LIMESTONE		2910-	2426-	2387-	2460-	2584-	1836-	2964-	2922-	2470-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2011-	3160-	2654-	2616-	2688-	2816-	2054-	3212-	3170-	2696-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE			2858-	2834-	2913-					2936-	
SILURIAN-DEVONIAN CARBONATES	2278-	3362-	2878-	2842-	2918-	3050-	2330-	3420-	3378-	2944-	
SALINA GROUP LOCKPORT DOLOMITE	2356- 2888-	3440- 4036-	2978- 3070-	2914- 3322-	2980- 3394-	3120- 3548-	2422- 2940-	3488- 4048-	3454- 4018-	3022- 3552-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3140- 3194-	4266- 4326-	3676-	3636-	3648- 3705-	3803- 3868-	3170- 3226-	4306- 4358-	4270- 4328-	3798- 3860-	
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3225- 3398-	4368- 4490- 4520-	3702- 3816- 3856-	3662- 3775- 3820-	3738- 3866- 3888-	3907- 4002- 4049-	3248- 3376- 3416-	4398- 4515- 4550-	4366- 4488- 4518-	3894- 4003- 4046-	
QUEENSTON FORMATION	3400-	4532-	3870-	3832-	3900-	4065-	3424-	4562-	4530-	4055-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina		Medina	Medina	Medina	Medina	
PRODUCING INTERVAL	3280-3297	4452-4528	3771-3808	3724-3770	3765-3833		3308-3333	4423-4458	4427-4526	3934-3995	
TOTAL DEPTH	3484	4606	4007	3923	3963	4143	3528	4657	4632	4141	
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	
RESULTS	250 Mcf AF Show of oil development Bushnell- Lexington pool Conneaut field	1,200 Mcf AF 1,000 psi/72 hrs. development Corry field	800 Mcf AF 950 psi/48 hrs. development Bull Reservoir pool North East field	1,100 Mcf AF 900 psi/48 hrs. development Bull Reservoir pool North East field	1,200 Mcf AF 1,100 psi/48 hrs. development Bull Reservoir pool North East field	Ory development Bailey Brook pool North East field	800 Mcf AF 1,000 psi/48 hrs. development Ounn Valley pool Erie field	800 Mcf AF 1,150 psi/72 hrs. development Corry field	1,500 Mcf AF 1,040 psi/72 hrs. development Corry field	500 Mcf AF 900 psi/48 hrs. development Waterford pool Leboeuf field	

COUNTY Permit Number	Erie 049-24912	Erie 049-24913	Erie 049-24914	Erie 049-24915	Erie 049-24919	Erie 049-24922	Erie 049-24925-0	Erie 049-24926	Erie 049-24928	Erie 049-24929
NAME OF WELL	J. Bobolnick #1	Robert Franz #1	Larry Kalika #5	Daniel Hroblewski #1	James Oniszewski #1	Q. Johnson #1	Floyd Truesdall #1	P. Vogel #1	Donald Meabon #1	William Gregory #2
OPERATOR	Mid American Natural Resources	N.E.A. Cross Company	Envirogas, Incorporated	Mid American Natural Resources	Meridian Exploration #945	Vineyard Oil & Gas Company	Fredericks Drilling Co. & Sons, Inc.	Mid American Natural Resources	Mid American Natural Resources	Fredericks Drilling Co. & Sons, Inc.
TOWNSHIP	Venango	McKean	Wayne	Venango	LeBoeuf	Venango	Venango	Venango	Greenfield	Venango
QUADRANGLE	Waterford	Erie South	Corry	Wattsburg	Cambridge Springs	Wattsburg	Wattsburg	Wattsburg	Wattsburg	Wattsburg
LATITUDE	100 ft. S 42°00'00"	13,100 ft. S 42°02'30"	6,660 ft. S 42°00'00"	12,800 ft. S 42°05'00"	7,000 ft. S 41°52'30"	8,300 ft. S 42°02'30"	10,300 ft. S 42°02'30"	11,500 ft. S 42°02'30"	4,825 ft. S 42°07'30"	13,300 ft. S 42°02'30"
LONGITUDE	1,500 ft. W 79°52'30"	7,650 ft. W 80°02'30"	5,490 ft. W 79°40'00"	5,550 ft. W 79°45'00"	6,700 ft. W 80°00'00"	8,875 ft. W 79°47'30"	7,800 ft. W 79°50'00"	10,280 ft. W 79°50'00"	2,225 ft. W 79°47'30"	4,000 ft. W 79°50'00"
DATE COMPLETED	1-8-88	12-11-87	12-18-87	12-10-87	3-22-88	3-16-88	2-2-88	2-29-88	4-1-88	2-18-88
ELEVATION	1450 GR	1205 GR	1670 GR	1530 GR	1440 GR	1301 GR	1515 GR	1518 GR	1360 GR	1570 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 2300-4010	COL: 1841-3643	COL: 524-4478 OLL: 2450-4486	COL/CNL: 2400-4037	COL: 2550-4350 OLL: 2500-4360 ENT: 4116-4310 INT: 4116-4310		CNL/COL: 1645-4097	COL/CNL: 2350-4082	COL/CNL: 1800-3604	
TULLY LIMESTONE	2352-	1910-	2768-	2452-	2668-	2292-	2418-	2400-	2110-	1870-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	2584-	2132-	3016-	2688-	2882-	2520-	2648-	2626-	2341-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE		2390-			3124-	2685-				
SILURIAN-DEVONIAN CARBONATES	2820-	2404-	3226-	2918-	3150-	2730-	2890-	2868-	2576-	
SALINA GROUP LOCKPORT DOLOMITE	2904- 3456-	2492- 3058-	3300- 3874-	2994- 3442-	3196- 3772-	2850- 3200-	2970- 3496-	2950- 3470-	2648- 3060-	3420- 3485-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3682- 3737-	3240- 3302-	4126- 4182-	3710- 3758-	4033- 4096-	3390- 3480-	3754- 3804-	3722- 3783-	3310- 3364-	3855-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	3770- 3860- 3926-	3340- 3450- 3492-	4222- 4342- 4376-	3796- 3900- 3946-	4130- 4246- 4298-	3625- 3745- 3778-	3837- 3936- 3990-	3816- 3930- 3968-	3393- 3514- 3548-	3870- 4012- 4054-
QUEENSTON FORMATION	3934-	3498-	4386-	3956-	4307-	3790-	4002-	3985-	3556-	4068-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina		Medina	Medina	Medina	Medina
PRODUCING INTERVAL	3804-3930	3355-3406	4257-4382	3860-3957	4170-4220		3880-4000	3874-3915	3442-3484	3912-4065
TOTAL DEPTH	4010	3657	4482	4037	4400	3894	4081	4062	3604	4162
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,100 Mcf AF 850 psi/48 hrs. development Waterford LeBoeuf field	1,000 Mcf AF 1,040 psi/48 hrs. development Corry Bailey field	700 Mcf AF 1,150 psi/72 hrs. development Corry field	1,000 Mcf AF 550 psi/48 hrs. development Bailey Brook field	Noncommercial gas 1,125 psi/168 hrs. development Edinboro North field	Show of gas 1,000 Mcf AF development Wattsburg pool North East field	386 Mcf AF 825 psi/48 hrs. development 256 feet Glenora pool Phillipsville field	1,500 Mcf AF 1,150 psi/48 hrs. development Glenora pool Phillipsville field	2,000 Mcf AF 800 psi/48 hrs. development Bull Run pool North East field	360 Mcf AF 1,100 psi/48 hrs. development Wattsburg pool North East field

Figure 35. (Continued).

COUNTY Permit Number	Erie 049-24930	Erie 049-24931	Erie 049-24932	Erie 049-24933	Erie 049-24939	Erie 049-24941	Erie 049-24946	Fayette 051-20489	Fayette 051-20494	Indiana 063-29489
NAME OF WELL	Raymond Kimmy #1	Eugene Patterson #1	Frank Truesdail #2	Richard Leasure #1	Louis Colussi #1	Henry Cass #1	James Eislager #1	Martin Marietta Corp. #1	Oarthea Speyer #1	North Pinetown Unit #2
OPERATOR	Fredericks Drilling Co. & Sons, Inc.	Mid American Natural Resources	Fredericks Drilling Co. & Sons, Inc.	Mid American Natural Resources	Mid American Natural Resources	Mid American Natural Resources	Envirogas, Incorporated	R. E. Fox & Associates, Inc.	CNG Development Company #4111	CNG Development Company #2818
TOWNSHIP	Venango	Waterford	Venango	Venango	Summit	Venango	Wayne	Springhill	Saltlick	Green
QUADRANGLE	Wattsburg	Cambridge Spgs., NE	Wattsburg	Hammett	Cambridge Spgs., NE	Wattsburg	Corry	Lake Lynn	Seven Springs	Barnesboro
LATITUDE	13.350 ft. S 42°02'30"	13.600 ft. S 42°00'00"	10.900 ft. S 42°02'30"	50 ft. S 42°02'30"	150 ft. S 42°00'00"	10.500 ft. S 42°02'30"	7.230 ft. S 42°00'00"	10.050 ft. S 39°45'00"	3.650 ft. S 40°02'30"	800 ft. S 40°42'30"
LONGITUDE	6.050 ft. W 79°50'00"	5.350 ft. W 80°02'30"	5.800 ft. W 79°50'00"	3.700 ft. W 79°52'00"	3.950 ft. W 80°02'30"	8.750 ft. W 79°50'00"	4.100 ft. W 79°40'00"	5.000 ft. W 79°45'00"	4.100 ft. W 79°20'00"	9.950 ft. W 78°47'30"
DATE COMPLETED	2-24-88	3-24-88	2-28-88	3-30-88	5-3-88	4-21-88	10-5-88	4-18-88	11-8-88	12-18-87
ELEVATION	1510 GR	1425 GR	1575 GR	1480 GR	1270 GR	1490 GR	1650 GR	1990 GR	1897 GR	1633 GR
LOGS RECEIVED AND LOGGED INTERVALS		COL/CNL: 0-3991			COL/CNL: 1800-3640 GD/GR: 1800-3640	COL/CNL: 1800-4041 GD/GR: 1800-4041	COL/OLL: 494-4458			
TULLY LIMESTONE	1815-	2325-		2240-	2007-	2368-	2746-	7039-		7358-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT		2547-		2480-	2230-	2596-	3000-	7556-	7356-	8106- 8114-
ORISKANY SANDSTONE RIDGELEY SANDSTONE				2730-	2487-	2790-	3173-	7806-	7528-	8205-
SILURIAN-DEVONIAN CARBONATES		2780-			2506-	2848-	3214-	7917-	7621-	8229-
SALINA GROUP LOCKPORT DOLOMITE	3350- 3415-	2886- 3400-	3400- 3460-		2595- 3098-	2890- 3459-	3292- 3886-			
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	3746 3806-	3638- 3694-	3530 3856-		3342- 3408-	3695- 3744-	4100- 4162-			
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	3818- 3955- 3996-	3737- 3844- 3891-	3875- 3998- 4030-		3446- 3528- 3564-	3764- 3890- 3932-	4198- 4318- 4356-			
QUEENSTON FORMATION	4009-	3896-	4048-			3942-	4364-			
PRODUCING FORMATION	Medina	Medina	Medina	Driskany	Medina	Medina	Medina	Ridgeley	Huntersville Ridgeley	Huntersville
PRODUCING INTERVAL	3624-4006	3783-3838	3860-4048	2730-2748	3471-3535	3809-3852	4250-4364	7810-7820	7396-7546	8117-8170
TOTAL DEPTH	4106	4011	4145	2748	3640	4041	4474	7992	7741	8388
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Driskany	Queenston	Queenston	Queenston	Heiderberg	Heiderberg	Heiderberg
RESULTS	1,175 Mcf AF development Wattsburg NorthEast field	1,000 Mcf AF 1,050 psi/48 hrs. development Reeds Corners field	406 Mcf AF 1,210 psi/120 hrs. development Wattsburg NorthEast field	700 Mcf AF 700 psi/48 hrs. extension Bartocic field	200 Mcf AF 800 psi/48 hrs. development Swails field	2,000 Mcf AF 950 psi/48 hrs. development Ondaga Phillipsville field	704 Mcf AF 3,410 psi/72 hrs. development Wattsburg field	3,410 psi/72 hrs. development Wattsburg field	1,716 Mcf AF 3,300 psi/72 hrs. development New Hill field	603 Mcf AF 3,300 psi/72 hrs. development Uniontown Living Waters field

COUNTY Permit Number	Indiana 063-29500	Junata 067-20002-P	Mercer 085-20594	Mercer 085-20606	Mercer 085-20699	Mercer 085-20739	Mercer 085-20740	Mercer 085-20744	Mercer 085-20749	Mercer 085-20750
NAME OF WELL	Ralph Trinkley #1	Englat #2	McBurney #1	Clifford Wescott #1	Struthers #1	Clarke #1	Five Brothers #1	O. Leall Unit #4	Kiefer #1	Spangler #1
OPERATOR	Felmont Oil Corporation #P-547	The Ridge Creek Gas & Oil Co., Inc.	Mark Resources Corporation	Cabot Oil & Gas Corporation	Viking Resources Corporation	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.
TOWNSHIP	Green	Tuscarora	Hermitage	French Creek	Coolspring	Hermitage	Shenango	Hermitage	Hermitage	Hermitage
QUADRANGLE	Commodore	McCoyville	Sharpville	New Lebanon	Mercer	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East
LATITUDE	8,275 ft. S 40°40'00"	9,600 ft. S 40°25'00"	8,100 ft. S 41°17'30"	6,550 ft. S 41°27'30"	2,100 ft. S 41°15'00"	3,550 ft. S 41°12'30"	7,400 ft. S 41°12'30"	6,300 ft. S 41°12'30"	5,400 ft. S 41°12'30"	3,925 ft. S 41°12'30"
LONGITUDE	7,490 ft. W 78°52'30"	1,035 ft. W 77°35'00"	10,090 ft. W 80°25'00"	9,450 ft. W 80°02'30"	5,000 ft. W 80°12'30"	12,650 ft. W 80°22'30"	3,200 ft. W 80°25'00"	7,550 ft. W 80°25'00"	4,250 ft. W 80°25'00"	400 ft. W 80°27'30"
DATE COMPLETED	12-17-87	7-22-88	4-10-84	5-19-84	7-10-85	11-20-85	11-13-85	12-3-85	12-5-85	12-21-85
ELEVATION	1657 GR	750 GR	934 GR	1432 GR	1240 GR	1090 GR	1050 GR	1000 GR	1150 GR	935 GR
LOGS RECEIVED AND LOGGED INTERVALS			GR/GO: 560-5108 LIT: 4800-5050 CBL/CM: 8-1100 PCL: 4700-5086	COL: 598-5608 LL: 0-5605		LTO/CM: 633-5480 OLL: 633-5480 INT: 5240-5470		CBL/VOL: 4296-5368 PCL/PC: 4296 5368	COL/OLL: 714-5471 OLL/GR: 714-5459 INT: 5230-5440 PCL/PC: 4296-5368	COL/OLL: 506-5305 OLL/GR: 506-5294 INT: 5043-5250
TULLY LIMESTONE	7320-		2994-	3682-	3792-	3450-			3432-	3203-
ONONDAGA LIMESTONE HUNTERVILLE GCHT	8040-	950-	3150-	3874-	3838-	3576-	3548-		3554-	3358-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	8153-		3334-	4024-	4090-	3750-	3722-		3726-	3545-
SILURIAN-DEVONIAN CARBONATES	8168-	1320-	3350-	4056-		3764-	3747-		3746-	3563-
SALINA GROUP LOCKPORT DOLOMITE		Wills Creek 2960- McKenzie 4550-	3504- 4383-	4164- 5000-	4434- 5074-	3936- 4822-	3921- 4782-	4719-	3920- 4782-	3742- 4586-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE			4685- 4738-	5228- 5294-	5560-	5106- 5166-	5094- 5154-	5008- 5070-	5088- 5150-	4902- 4962-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE			4810- 4922- 5000-	5347- 5506- 5538-	5580- 5704- 5766-	5246- 5367- 5442-	5360- 5430-	5152- 5270- 5345-	5230- 5270- 5426-	5042- 5158- 5238-
QUEENSTON FORMATION			5019-	5552-	5780-	5452-	5444-	5352-	5433-	5246-
PRODUCING FORMATION	Huntersville Ridgeley		Medina	Medina		Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	8063-8164		4872-5014	5401-5502		5296-5396	5286-5357	5202-5269	5283-5350	5092-5156
TOTAL DEPTH	8240	5286	5125	5618	5850	5480	5491	5413	5474	5508
DEEPEST FORMATION REACHED	Heiderberg	McKenzie	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	475 Mcf AF 3,200 psi/48 hrs. development Lizokitz pool Strongstown field	Plugged and abandoned Newfield wildcat	1,475 Mcf AF 1,475 psi/326 hrs. development Sharon Deep pool Sharon field	200 Mcf AF 1,120 psi/48 hrs. development Kanz Corners field	Ory and abandoned extension Filer Corners pool Coolspring field	1,210 Mcf AF 1,500 psi/48 hrs. development Greenfield field	675 Mcf AF 1,450 psi/48 hrs. development Greenfield field	1,120 Mcf AF 1,435 psi/48 hrs. development wheatland field	875 Mcf AF 1,025 psi/48 hrs. development Greenfield field	1,400 Mcf AF 1,430 psi/48 hrs. development wheatland field

Figure 35. (Continued).

COUNTY Permit Number	Mercer 085-20754	Mercer 085-20755	Mercer 085-20760	Mercer 085-20765	Mercer 085-20766	Mercer 085-20768	Mercer 085-20774	Mercer 085-20776	Mercer 085-20847	Mercer 085-20851
NAME OF WELL	Kerina #3	Clarke #3	C. Foltz #3	Rowe #1	Kerina #1	O. Leall Unit #3	Peterson Unit #1	Clarke #2	Gaines #1	Currie #1
OPERATOR	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.
TOWNSHIP	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Hickory	Hermitage	Hermitage	Hermitage
QUADRANGLE	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East
LATITUDE	5,800 ft. S 41°12'30"	2,600 ft. S 41°12'30"	3,200 ft. S 41°12'30"	13,800 ft. S 41°15'00"	4,620 ft. S 41°12'30"	5,800 ft. S 41°12'30"	15,150 ft. S 41°15'00"	1,750 ft. S 41°12'30"	3,300 ft. S 41°12'30"	9,600 ft. S 41°15'00"
LONGITUDE	11,800 ft. W 80°25'00"	3,450 ft. W 80°25'00"	11,100 ft. W 80°22'30"	2,425 ft. W 80°25'00"	10,700 ft. W 80°25'00"	5,900 ft. W 80°25'00"	12,700 ft. W 80°22'30"	1,300 ft. W 80°25'00"	9,150 ft. W 80°22'30"	8,000 ft. W 80°22'30"
DATE COMPLETED	11-12-85	12-10-85	12-12-85	12-20-85	11-19-85	11-25-85	12-17-85	12-18-85	2-12-88	12-1-87
ELEVATION	900 GR	1090 GR	1115 GR	1113 GR	970 GR	1045 GR	1110 GR	1095 GR	1135 GR	1208 GR
LOGS RECEIVED AND LOGGED INTERVALS	LTD/CNL: 622-5486 OLL: 622-5486 INT: 5220-5460	LTD/CNL: 653-5557 OLL: 653-5557 INT: 5280-5490	CDL/CNL: 630-5497 OLL: 630-5485 INT: 5225-5440	LTD/CNL: 526-5538 OLL: 526-5538	LTD/CNL: 619-5470 OLL: 619-5470 CBL/VOL: 4610-5455 PCL: 5260-5324	LTD/CNL: 640-5508 DLL: 640-5485	COL/CNL: 627-5517 OLL: 627-5503 CBL/VOL: 4630-5580 INT: 5240-5450 PCL: 635-5463	COL/CNL: 705-5569 DLL: 705-5569 CBL/VOL: 4600-5570 PCL: 4600-5570		
TULLY LIMESTONE		3434-	3484-	3436-	3288-	3412-	3450-	3447-	3500-	3490-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT		3340-	3608-	3562-	3410-	3534-	3576-	3574-	3626-	3656-
ORISKANY SANDSTONE RIDGELEY SANDSTONE		3524-	3780-	3736-	3592-	3710-	3754-	3744-	3800-	3834-
SILURIAN-DEVONIAN CARBONATES		3544-	3800-	3760-	3614-	3727-	3770-	3764-	3814-	3860-
SALINA GROUP LOCKPORT DOLOMITE		3718- 4578-	3968- 4854-	3930- 4804-	3790- 4668-	3904- 4760-	3938- 4794-	3934- 4790-	3990- 4852-	4022- 4874-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		4886- 4945-	5146- 5202-	5086- 5146-	4948- 5010-	5064- 5126-	5103- 5160-	5100- 5162-	5175- 5272-	5187- 5246-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE		5146- 5216-	5282- 5405- 5478-	5222- 5345- 5418-	5091- 5236- 5284-	5206- 5336- 5400-	5237- 5360- 5434-	5240- 5362- 5434-	5310- 5444- 5516-	5324- 5444- 5516-
OUFENSTON FORMATION		5230-	5486-	5426-	5295-	5410-	5442-	5446-	5526-	5526-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5092-5176	5285-5350	5328-5403	5282-5341	5162-5236	5272-5324	5284-5358	5301-5361	5358-5429	5366-5474
TOTAL DEPTH	5263	5501	5560	5500	5338	5470	5511	5521	5645	5584
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	700 Mcf AF 1,450 psi/48 hrs. development Wheatland field	1,325 Mcf AF 1,500 psi/48 hrs. development Greenfield field	1,150 Mcf AF 1,500 psi/48 hrs. development Greenfield field	875 Mcf AF 1,400 psi/48 hrs. development Sharon Deep pool Sharon field	625 Mcf AF 1,450 psi/48 hrs. development Wheatland field	987 Mcf AF 1,425 psi/48 hrs. development Wheatland field	489 Mcf AF 1,320 psi/48 hrs. development Greenfield field	1,080 Mcf AF 1,425 psi/48 hrs. development Greenfield field	950 Mcf AF 1,310 psi/48 hrs. development Greenfield field	1,100 Mcf AF 1,180 psi/48 hrs. development Sharon Deep pool Sharon field

COUNTY Permit Number	Mercer 085-20853	Mercer 085-20854	Mercer 085-20855	Mercer 085-20856	Mercer 085-20857	Mercer 085-20858	Mercer 085-20859	Mercer 085-20860	Mercer 085-20861	Mercer 085-20862-P
NAME OF WELL	Hanson #1	Rollinson #4	Boyer #1	Miller #1	Kovach #1	City of Hermitage #1	Sperring #1	Sperring #2	Weich Unit #1	W. & L. Canon #1
OPERATOR	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Mark Resources Corporation
TOWNSHIP	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Lake
QUADRANGLE	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Jackson Center
LATITUDE	9,600 ft. S 41°15'00"	10,000 ft. S 41°15'00"	7,900 ft. S 41°15'00"	13,300 ft. S 41°15'00"	11,800 ft. S 41°15'00"	11,600 ft. S 41°15'00"	15,300 ft. S 41°15'00"	15,400 ft. S 41°15'00"	4,650 ft. S 41°12'30"	4,400 ft. S 41°22'30"
LONGITUDE	9,900 ft. W 80°22'30"	11,700 ft. W 80°22'30"	8,800 ft. W 80°22'30"	6,600 ft. W 80°22'30"	7,700 ft. W 80°22'30"	11,000 ft. W 80°22'30"	7,450 ft. W 80°22'30"	9,200 ft. W 80°22'30"	10,100 ft. W 80°22'30"	9,550 ft. W 80°07'30"
DATE COMPLETED	3-11-88	2-5-88	12-8-87	2-9-88	1-12-88	12-3-87	2-20-88	2-15-88	3-1-88	11-26-87
ELEVATION	1168 GR	1145 GR	1180 GR	1115 GR	1150 GR	1140 GR	1127 GR	1138 GR	1110 GR	1218 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL/CNL: 643-5496 DLL/GR: 643-5496 CBL/FCL: 4466-5496 INT: 5300-5430	CDL/CNL: 587-5472 DLL/GR: 587-5510 INT: 5210-5450	CDL/CNL: 685-5563 CBL/FCL: 4590-5505 DLL: 685-5563	CDL/CNL/GR: 0-5417 DLL/GR: 685-5417 INT: 5284-5377	CDL/CNL: 626-5556 CBL/FCL: 626-5510 DLL: 626-5556 INT: 5300-5460	CDL/CNL: 598-5582 DLL/GR: 598-5582 INT: 5300-5529 CBL/VDL: 4850-5529	CDL/CNL: 1190-5565 DLL/GR: 1190-5582 INT: 5300-5529 CBL/FCL: 4570-5553	CDL/CNL: 0-5564 DLL/GR: 1190-5582 INT: 5300-5529 CBL/FCL: 4396-5529		
TULLY LIMESTONE	3472-	3450-	3478-		3480-	3460-	3495-	3498-	3490-	3568-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3611-	3582-	3610-	3599-	3612-	3588-	3622-	3626-	3616-	3730-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3786-	3757-	3800-	3772-	3790-	3770-	3798-	3797-	3796-	3876-
SILURIAN-DEVONIAN CARBONATES	3796-	3768-	3816-	3798-	3814-	3786-	3806-	3806-	3812-	3904-
SALINA GROUP LOCKPORT DOLOMITE	3974- 4844-	3946- 4812-	3978- 4856-	3962- 4822-	3980- 4858-	3952- 4816-	3986- 4854-	3989- 4856-	3978- 4868-	4074- 4766-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5196- 5232-	5104- 5160-	5136- 5198-	5132- 5190-	5144- 5206-	5108- 5170-	5224- 5258-	5222- 5262-	5224- 5262-	5084- 5196-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5268-	5236- 5400- 5432-	5274- 5394- 5470-	5408- 5464-	5284-	5246- 5364- 5442-	5294- 5416- 5488-	5296- 5414- 5490-	5298- 5422- 5496-	5313- 5360- 5416-
QUEENSTON FORMATION		5440-	5478-	5477-		5451-	5500-	5496-	5504-	5426-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	
PRODUCING INTERVAL	5313-5382	5290-5396	5324-5394	5539-5405	5338-5402	5307-5403	5354-5449	5337-5412	5360-5420	
TOTAL DEPTH	5540	5525	5578	5558	5603	5571	5597	5597	5579	5533
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Medina	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,700 Mcf AF 1,360 psi/48 hrs. development Sharon Deep pool Sharon field	1,100 Mcf AF 1,340 psi/48 hrs. development Sharon Deep pool Sharon field	950 Mcf AF 1,360 psi/48 hrs. development Sharon Deep pool Sharon field	1,050 Mcf AF 1,320 psi/48 hrs. development Greenfield field	1,700 Mcf AF 1,460 psi/48 hrs. development Greenfield field	1,400 Mcf AF 1,420 psi/48 hrs. development Greenfield field	1,310 Mcf AF 1,310 psi/48 hrs. development Greenfield field	1,270 Mcf AF 1,380 psi/48 hrs. development Greenfield field	850 Mcf AF 1,280 psi/48 hrs. development Greenfield field	Plugged and abandoned development pool Stoneman field

Figure 35. (Continued).

COUNTY Permit Number	Mercer 085-20864	Mercer 085-20865	Mercer 085-20866	Mercer 085-20867	Mercer 085-20868	Mercer 085-20869	Mercer 085-20870	Mercer 085-20871	Mercer 085-20873	Mercer 085-20874
NAME OF WELL	Morefield #1	Tavolsky #1	Corman #1	Valentine #1	Leall #5	Kraynak #1	Hickory VFW #1	Kraynak #2	Reno #1	Coulter #1
OPERATOR	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.
TOWNSHIP	Hermitage	Hermitage	Hermitage	Shenango	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage	Hermitage
QUADRANGLE	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharon East	Sharpsville	Sharpsville
LATITUDE	8,350 ft. S 41°15'00"	11,600 ft. S 41°15'00"	800 ft. S 41°15'00"	7,300 ft. S 41°12'30"	6,050 ft. S 41°12'30"	5,500 ft. S 41°15'00"	5,600 ft. S 41°15'00"	7,200 ft. S 41°15'00"	14,900 ft. S 41°17'30"	14,800 ft. S 41°17'30"
LONGITUDE	1,300 ft. W 80°27'30"	9,300 ft. W 80°22'30"	4,900 ft. W 80°22'30"	1,500 ft. W 80°25'00"	200 ft. W 80°25'00"	4,550 ft. W 80°22'30"	950 ft. W 80°25'00"	4,500 ft. W 80°22'30"	3,300 ft. W 80°22'30"	6,300 ft. W 80°22'30"
DATE COMPLETED	1-26-88	12-15-87	3-30-88	3-17-88	3-8-88	12-17-87	2-25-88	1-16-88	3-22-88	3-15-88
ELEVATION	1105 GR	1050 GR	1105 GR	1069 GR	1083 GR	1104 GR	1186 GR	1112 GR	1065 GR	1178 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL/CNL: 572-5349 CBL/PCU: 4610-5338 OLL/GR: 572-5367	CDL/CNL: 642-5555 CBL/PCU: 4700-5500 OLL: 642-5555 INT: 642-5555	CDL/CNL: 612-5455 OLL: 612-5455 INT: 612-5455 CBL/PCU: 4530-5451	CDL/CNL: 0-5543 OLL/GR: 0-5543 CBL/PCU: 4533-5533 INT: 0-5543	CDL/CNL: 603-5532 OLL: 603-5550 CBL/PCU: 4500-5541 INT: 603-5532	CDL/CNL: 563-5489 OLL/GR: 563-5507 CBL/VOL: 4500-5486 INT: 5240-5370	CDL/CNL: 0-5475 OLL/GR: 2686-5493 CBL/PCU: 4530-5460 INT: 5240-5450	CDL/CNL: 523-5413 OLL/MSFL: 523-5531 CBL/PCU: 4620-5411 INT: 5115-5340	CDL/CNL: 523-5413 OLL/MSFL: 523-5531 CBL/PCU: 4620-5411 INT: 5115-5340	CDL/CNL: 601-5524 OLL/GR: 601-5524 CBL/PCU: 4478-5496 INT: 5250-5430
TULLY LIMESTONE	3286-	3473-	3372-	3446-	3472-	3400-	3445-	3335-	3466-	3428-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3440-	3606-	3502-	3570-	3597-	3534-	3576-	3576-	3560-	3560-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3634-	3780-	3666-	3740-	3768-	3708-	3754-	3632-	3734-	3734-
SILURIAN-DEVONIAN CARBONATES	3645-	3804-	3698-	3820-	3785-	3732-	3767-	3700-	3744-	3744-
SALINA GROUP LOCKPORT DOLOMITE	3814- 4692-	3970- 4840-	3856- 4768-	3934- 4812-	3956- 4858-	3892- 4804-	3928- 4804-	3812- 4722-	3812- 4722-	3811- 4920-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4972- 5030-	5132- 5132-	5098- 5136-	5120- 5228-	5206- 5246-	5070- 5130-	5174- 5210-	5073- 5155-	5006- 5098-	5100- 5184-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRPOOL SANDSTONE	5104- 5220- 5301-	5270- 5290- 5462-	5170- 5290- 5365-	5264- 5385- 5456-	5280- 5402- 5476-	5204- 5328- 5400-	5244- 5354- 5400-	5130- 5254- 5326-	5130- 5254- 5326-	5218- 5376- 5414-
QUEENSTON FORMATION	5310-	5472-	5373-	5466-	5484-	5410-	5436-	5332-	5436-	5420-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5146-5218	5317-5386	5215-5287	5305-5382	5376-5400	5248-5360	5294-5397	5280-5383	5177-5251	5267-5366
TOTAL DEPTH	5382	5570	5470	5558	5565	5522	5508	5536	5446	5538
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,230 Mcf AF 1,220 psi/48 hrs. development Sharon Deep pool Sharon field	1,150 Mcf AF 1,270 psi/48 hrs. development Greenfield field	1,020 Mcf AF 1,400 psi/48 hrs. development Sharon Deep pool Sharon field	680 Mcf AF 1,280 psi/48 hrs. development Greenfield field	950 Mcf AF 1,150 psi/48 hrs. development Greenfield field	1,210 Mcf AF 1,440 psi/48 hrs. development Sharon Deep pool Sharon field	1,610 Mcf AF 1,380 psi/48 hrs. development Sharon Deep pool Sharon field	1,750 Mcf AF 1,300 psi/48 hrs. development Sharon Deep pool Sharon field	1,200 Mcf AF 1,280 psi/48 hrs. development Sharon Deep pool Sharon field	890 Mcf AF 1,220 psi/48 hrs. development Sharon Deep pool Sharon field

COUNTY Permit Number	Mercer 085-20878	Mercer 085-20880	Mercer 085-20884	Mercer 085-20891	Mercer 085-20892	Mercer 085-20893	Mercer 085-20894	Mercer 085-20903	Mercer 085-20912-P	Mercer 085-20919	
NAME OF WELL	Oarby Unit #1	Hogue #1	Coppage #1	L. Hayla Unit #1	Helen Opalenik #1	Rollinson Unit #2	Stull #1	Selenchik #1	George R. Gregg, et al #1	Hassel Unit #1	
OPERATOR	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Everflow Eastern, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Atlas Resources, Inc.	Cabot Oil & Gas Corporation	Atlas Resources, Inc.	
TOWNSHIP	Hermitage	Hermitage	Hermitage	Hermitage	Shenango	Hermitage	Hermitage	Hermitage	Liberty	Hermitage	
QUADRANGLE	Sharon East	Sharpville	Sharon East	Sharon East	Sharon West	Sharon East	Sharon East	Sharon East	Grove City	Sharon East	
LATITUDE	7,950 ft. S 41°15'00"	13,300 ft. S 41°17'30"	5,800 ft. S 41°15'00"	1,600 ft. S 41°12'30"	9,450 ft. S 41°12'30"	9,075 ft. S 41°15'00"	850 ft. S 41°12'30"	8,200 ft. S 41°15'00"	14,640 ft. S 41°10'00"	6,650 ft. S 41°15'00"	
LONGITUDE	7,150 ft. W 80°22'30"	5,400 ft. W 80°22'30"	7,850 ft. W 80°22'30"	6,350 ft. W 80°22'30"	4,500 ft. W 80°30'00"	1,950 ft. W 80°25'00"	2,300 ft. W 80°25'00"	5,700 ft. W 80°22'30"	1,500 ft. W 80°05'00"	5,700 ft. W 80°22'30"	
DATE COMPLETED	12-10-87	4-6-88	12-22-87	4-13-88	2-8-88	1-11-88	3-24-88	2-2-88	1-15-88	2-18-88	
ELEVATION	1210 GR	1220 GR	1175 GR	1127 GR	976 GR	1182 GR	1108 GR	1165 GR	1217 GR	1165 GR	
LOGS RECEIVED AND LOGGED INTERVALS	OLL/GR: 701-5597 CBL/PCI: 4550-5515 LTO/CNL: 701-5597	COL/CNL: 0-5541 OLL/GR: 0-5541 CBL/PCI: 4650-5528 INT: 5250-5470	COL/CNL: 640-5522 OLL/GR: 640-5540 CBL/VDL: 4622-5546 INT: 5290-5420	COL/CNL: 0-5983 OLL/GR: 619-5981 CBL/PCI: 4700-5542 INT: 5313-5525	COL/CNL: 200-5380		COL/CNL: 576-5515 OLL/GR: 576-5533 CBL/PCI: 4790-5497 INT: 5240-5450	COL/CNL: 620-5545 OLL: 620-5545 INT: 620-5545		COL/CNL: 0-5337 OLL/GR: 3670-5337 CBL/PCI: 4450-5504	
TULLY LIMESTONE	3512-	3464-	3450-	3505-			3453-	3484-	4288-	3470-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3644-	3597-	3582-	3630-	3354-	3600-	3578-	3604-	4480-	3600-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3828-	3764-	3759-	3806- Bois Blanc		3772-		3800-	4616-	3780-	
SILURIAN-DEVONIAN CARBONATES	3852-	3786-	3784-	3886-	3626-	3794-	3826-	3818-	4625-	3790-	
SALINA GROUP LOCKPORT DOLOMITE	4014- 4874-	3939- 4840-	3944- 4834-	3998- 4864-	3746- 4634-	3959- 4810-	3942- 4812-	3982- 4864-	5033- 5620-	3964- 4836-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5178- 5240-	5184- 5218-	5122- 5181-	5171- 5260-	4927- 5028-	5124- 5175-	5102- 5210-	5208- 5242-	5993- 6089-	5200- 5232-	
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5316- 5436- 5508-	5258- 5400- 5450-	5256- 5376- 5452-	5312- 5372- 5470-	5066- 5182- 5262-		5246- 5363- 5438-	5280- 5438- 5474-	6230- 6355- 6370-	5392- 5466-	
QUEENSTON FORMATION	5520-	5454-	5458-	5508-	5278-		5446-		6380-	5474-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina		Medina	Medina		Medina	
PRODUCING INTERVAL	5363-5435	5291-5397	5301-5413	5354-5455	5130-5277		5299-5360	5330-5434		5326-5390	
TOTAL DEPTH	5612	5556	5555	5596	5394	5350	5549	5560	6613	5576	
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Thorold	Queenston	Queenston	Queenston	Queenston	
RESULTS	1,300 Mcf AF 1,260 psi/48 hrs. development Sharon Deep pool field	980 Mcf AF 1,280 psi/48 hrs. development Sharon Deep pool field	400 Mcf AF 540 psi/48 hrs. development Sharon Deep pool field	750 Mcf AF 825 psi/48 hrs. development Greenfield field	100 Mcf AF and 1 Bopd 1,500 psi/48 hrs. development Wheatland field	Junked and abandoned Sharon field		900 Mcf AF 840 psi/48 hrs. development Greenfield field	1,100 Mcf AF 1,380 psi/48 hrs. development Sharon Deep pool field	Plugged and abandoned development Valcourt field	1,230 Mcf AF 1,360 psi/48 hrs. development Sharon Deep pool field

Figure 35. (Continued).

COUNTY Permit Number	Mercer 085-20921	Mercer 085-20922	Mercer 085-20925	Montgomery 091-20001-P	Somerset 111-20071-R	Somerset 111-20158	Somerset 111-20163	Somerset 111-20164	Somerset 111-20166	Somerset 111-20170
NAME OF WELL	Rollinson Unit #2A	Mudrak #1	Guy W. Harper Unit #1	Joseph A. Parenstis #1	Common. of PA Tract 111-A #1	Commonwealth of Pa. Tract #280	Common. of PA Tract 354 #1	William H. Keyser #1	Seven Springs Borough #1	Bird Coal Co. #1
OPERATOR	Atlas Resources, Inc.	Atlas Resources, Inc.	Everflow Eastern, Inc.	North Central Dill Corporation	Doran & Associates, Inc. #KP-163	CNG Development Corp. #2528	CNG Development Corp. #3181	CNG Development Corp. #4110	CNG Development Corp. #3209	CNG Development Corp. #4108
TOWNSHIP	Hermitage	Hermitage	Lackawanna	New Hanover	Lower Turkeyfoot	Elk Lick	Lincoln	Jenner	Middlecreek	Jenner
QUADRANGLE	Sharon East	Sharon East	Greenfield	Sassamsville	Kingwood	Markelton	Ligonier	Boswell	Seven Springs	Boswell
LATITUDE	9,000 ft. S 41°15'00"	2,400 ft. S 41°15'00"	7,200 ft. S 41°15'00"	12,300 ft. S 40°22'30"	4,350 ft. S 39°55'00"	3,600 ft. S 39°47'30"	10,275 ft. S 40°10'00"	9,250 ft. S 40°12'30"	14,400 ft. S 40°02'30"	2,525 ft. S 40°15'00"
LONGITUDE	2,150 ft. W 80°25'00"	6,000 ft. W 80°22'30"	10,150 ft. W 80°20'00"	13,320 ft. W 75°30'00"	5,400 ft. W 79°20'00"	8,950 ft. W 79°07'30"	8,350 ft. W 79°07'30"	7,300 ft. W 79°00'00"	10,050 ft. W 79°15'00"	7,200 ft. W 79°02'30"
DATE COMPLETED	1-29-88	3-3-88	4-21-88	12-29-87	3-17-88	2-22-88	8-23-88	6-5-88	8-18-88	10-26-88
ELEVATION	1180 GR	1145 GR	1242 GR	340 GR	2403 GR	2784 GR	2625 GR	1965 GR	2406 GR	2268 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL/CNL: 0-5518 DLL/GR: 664-5538 CBL/PCU: 4720-5514 INT: 5190-5490	CDL/CNL: 602-5509 DLL/GR: 602-5527 CBL/PCU: 4492-5456 INT: 5190-5430	CDL/CNL: 500-5670							
TULLY LIMESTONE	3468-	3409-					7426-	7730-	7300-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3599-	3540-	3718-		7980-		8595- 8620-	8533- 8551-	8050- 8072-	7740- 7750-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3778-	3720-	3882-		8099-	8728-	8752-	8662-	8150-	7835-
SILURIAN-DEVONIAN CARBONATES	3794-	3740-	3908-			8856-	8820-	8738-	8210-	7854-
SALINA GROUP LOCKPORT DOLOMITE	3958- 4832-	3898- 4790-	4072- 4888-							
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5182- 5216-	5138- 5172-	5250- 5306-							
GRIMSBY FORMATION CAROL HEAD SHALE WHIRLPOOL SANDSTONE	5252- 5416- 5444-	5208- 5366- 5404-	5386- 5510- 5578-							
QUEENSTON FORMATION	5456-	5412-	5594-							
PRODUCING FORMATION	Medina	Medina	Medina		Ridgeley	Huntersville Ridgeley	Heiderberg	Ridgeley	Huntersville Ridgeley	Huntersville Ridgeley
PRODUCING INTERVAL	5302-5413	5252-5364	5430-5593		7969-8034	8773-8788	8620-8760	8707	8064-8246	7744-7864
TOTAL DEPTH	5553	5542	5692		8278	8997	8942	8875	8398	8106
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston		Huntersville	Heiderberg	Huntersville Ridgeley	Heiderberg	Heiderberg	Heiderberg
RESULTS	1,470 Mcf AF 1,320 psi/48 hrs. development Sharon Deep pool Sharon field	1,020 Mcf AF 1,360 psi/48 hrs. development Sharon Deep pool Sharon field	1,000 Mcf AF 1,350 psi/48 hrs. development Greenfield field	Unsuccessful New field wildcat data unavailable	1,036 Mcf AF 3,200 psi/120 hrs. New pool wildcat Lower Turkeyfoot pool Dhiopyle field	1,500 Mcf AF 3,751 psi/48 hrs. New field wildcat Mt. Davis field	5,452 Mcf AF 3,000 psi/11 hrs. extension Silvermine pool Linn Run field	7,500 Mcf AF 3,850 psi/72 hrs. New field wildcat Glessner field	2,098 Mcf AF 3,270 psi/72 hrs. development Olatillery pool Seven Springs field	1,409 Mcf AF 1,150 psi/48 hrs. development Williams pool Johnstown field

COUNTY Permit Number	Somersett 111-20173	Sullivan 113-20002-P	Tioga 117-20151	Tioga 117-20153	Venango 121-35563	Venango 121-35848	Venango 121-36456	Venango 121-36458	Venango 121-36467	Venango 121-36534
NAME OF WELL	Jay R. Sechler, et. ux. #1	Leo Oleffenbach #1	Learn TW-209, #2	Meeker MW-707, #3	R. Moorhead #3	B. Borger #2	Ray Lynn #1	Raymond Gilliland #1	M.S. Adamczyk #1	R.W. Orake #1
OPERATOR	CNG Development Corp. #4118	CNG Development Corp. #2951	North Penn Gas Company	North Penn Gas Company	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation
TOWNSHIP	Upper Turkeyfoot	Davidson	Farmington	Lawrence	Jackson	Jackson	Canal	Canal	Jackson	Jackson
QUADRANGLE	Confluence	Elk Grove	Elkland	Tioga	Utica	Utica	Utica	Utica	Franklin	Sugar Lake
LATITUDE	11°35'0" S 39°52'30" W	7°40'0" S 41°22'30" W	13°30'0" S 41°57'30" W	5°85'0" S 41°57'30" W	5°00'0" S 41°30'00" W	7°03'0" S 41°30'00" W	11°30'0" S 41°30'00" W	12°55'0" S 41°30'00" W	8°95'0" S 41°30'00" W	8°38'0" S 41°32'30" W
LONGITUDE	9°75'0" W 79°15'00" W	2°90'0" W 76°27'30" W	3°45'0" W 77°15'00" W	5°15'0" W 77°07'30" W	4°75'0" W 79°52'30" W	4°02'0" W 79°52'30" W	8°95'0" W 79°57'30" W	7°90'0" W 79°55'00" W	5°05'0" W 79°50'00" W	2°82'0" W 79°52'30" W
DATE COMPLETED	11-1-88	7-24-88	9-20-88	10-4-88	6-2-84	6-16-84	5-5-84	6-25-84	9-22-84	5-6-84
ELEVATION	1956 GR	2317 GR	1844 GR	1708 GR	1378 GR	1298 GR	1125 GR	1385 GR	1218 GR	1205 GR
LOGS RECEIVED AND LOGGED INTERVALS		CL/CNL/GR: 3800-4100 CBL: 0-4000	CL/CNL/GR: 3800-4100 CBL: 0-4000	CNL/GR: 0-4245 CBL: 0-4220	GR/COL/CNL: 30-5618 GR/GO: 545-5613	GR/COL/CNL: 32-5585 GR/PCL: 5100-5478	COL: 48-5322 LL: 400-5322	COL: 30-5654 LL: 30-5651	GR/COL/CNL: 0-5674 GR/CBL: 5300-5614 INT: 5300-5630	INT: 5100-5400 GR/COL/CNL: 0-5402 GR/GO: 550-5396 PCL: 5000-5253
TULLY LIMESTONE		7500-	3140-	3240-	3697-	3628-	3382-	3714-	3696-	3474-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	8557-	9200-	4040-	4220-	3914-	3848-	3600-	3946-	3932-	3700-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	8890-	9540-	4079-	4243-	4044-	3982-	3738-	4082-	4056-	3834-
SILURIAN-DEVONIAN CARBONATES		9647-			4074-	4010-	3758-	4098-	4084-	3852-
SALINA GROUP LOCKPORT DOLOMITE		11,654-			4184- 4950-	4124-	3896- 4614-	4224- 4954-	4202- 4980-	3962- 4716-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		11,791-			5249- 5316-	5254-	4937- 5002-	5280- 5344-	5257- 5328-	4997- 5062-
GRIMSBY FORMATION CARBON HEAD SHALE WHIRLPOOL SANDSTONE		Tuscarora-12,746 Juniata-13,560 Oswego-13,562			5380- 5520- 5552-	5318- 5457- 5492-	5063- 5220- 5248-	5410- 5544- 5590-	5396- 5526- 5563-	5122- 5250- 5292-
QUEENSTON FORMATION		Bald Eagle-14,708			5566-	5502-	5257-	5596-	5578-	5306-
PRODUCING FORMATION	Huntersville Ridgeley		Ridgeley Storage	Ridgeley Storage	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	8672-9036				5425-5513	5339-5448	5076-5194	5432-5541	5445-5524	5157-5246
TOTAL DEPTH	9158	17,581	4112	4264	5650	5600	5331	5656	5657	5420
DEEPEST FORMATION REACHED	Driskany	Beekmantown	Driskany	Oriskany	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	874 Mcf AF 3,500 psi/144 hrs. development Paddytown field	Reedsville-15,384 Utica-16,110 Salona-16,884 Linden Hall-17,112 Batter-17,507 Bellefonte-17,561 Plugged & abandoned	11,969 Mcf AF 1,440 psi storage pressure West End Tioga storage pool Tioga storage field	33,074 Mcf AF 948 psi storage pressure Meeker storage pool Tioga storage field	950 Mcf AF 1,460 psi/72 hrs. development Beatty Run pool Cooperstown field	3,000 Mcf AF 1,465 psi/72 hrs. development Beatty Run pool Cooperstown field	250 Mcf AF 1,100 psi/72 hrs. development Cochranon field	850 Mcf AF 1,490 psi/48 hrs. development Canal pool McCune Run field	2,500 Mcf AF 1,460 psi/72 hrs. development Galloway pool Franklin-Oak Forest field	919 Mcf AF 1,450 psi/168 hrs. development Beatty Run pool Cooperstown field

Figure 35. (Continued).

COUNTY Permit Number	Venango 121-36952	Venango 121-37389	Venango 121-37911	Venango 121-38234	Venango 121-39036	Venango 121-41120	Venango 121-41282	Venango 121-41287	Venango 121-41288	Venango 121-41313
NAME OF WELL	Samuel Kuzema #1-A	R. Gurnee #1	Houk, et al. #1	O.R. Jacoby #3	W.T. Baird #1	B. Fleming #3	P.H. Oeeter (North) #4	C. & E. Hazlett #2	E. & M. McElhanev #1	Nuhfer-Ouglas, et al Unit #1
OPERATOR	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation
TOWNSHIP	Canal	Canal	Sugar Creek	Jackson	Jackson	Jackson	Jackson	Jackson	Sugar Creek	Coopersstown
QUADRANGLE	Sugar Lake	Utica	Utica	Franklin	Sugar Lake	Dempseytown	Dempseytown	Sugar Lake	Franklin	Franklin
LATITUDE	14,900 ft. S 41°32'30"	13,130 ft. S 41°30'00"	9,130 ft. S 41°30'00"	10,300 ft. S 41°30'00"	14,240 ft. S 41°35'00"	6,880 ft. S 41°32'30"	8,350 ft. S 41°32'30"	13,700 ft. S 41°35'00"	12,150 ft. S 41°30'00"	1,800 ft. S 41°30'00"
LONGITUDE	11,200 ft. S 79°52'30"	9,130 ft. W 79°52'30"	5,080 ft. W 79°52'30"	3,380 ft. W 79°50'00"	10,230 ft. W 79°52'30"	3,300 ft. W 79°50'00"	4,650 ft. W 79°50'00"	550 ft. W 79°55'00"	5,600 ft. W 79°50'00"	10,800 ft. W 79°50'00"
DATE COMPLETED	6-8-84	6-18-84	9-13-84	9-13-84	9-21-84	6-27-85	7-15-85	6-21-85	7-31-85	9-4-85
ELEVATION	1510 GR	1218 GR	1122 GR	1259 GR	1529 GR	1412 GR	1472 GR	1529 GR	1440 GR	1120 GR
LOGS RECEIVED AND LOGGED INTERVALS	OLL: 603-5663 MSFL: 603-5663 INT: 5300-5530	GR/COL/CNL: 0-5569 GR/GO: 545-5562 INT: 5300-5530	GR/COL/CNL: 10-5470 GR/GO: 545-5562 INT: 5300-5530 GR: 5100-5440	GR/COL/CNL: 0-5703 GR/GO: 545-5562 GR/CBL: 5350-5695	INT: 5300-5530 GR/GO: 530-5556 CBL: 5330-5626	COL/CNL/GR: 0-5658 LL/GR: 530-5652 CBL: 5330-5626	COL/CNL: 893-5698 LL: 893-4448 CBL: 5380-5678	LL: 650-5558 GR: 5250-5552 PCL: 5250-5552	COL/CNL/GR: 0-5904 GR/CBL: 5560-5827	
TULLY LIMESTONE	3790-	3592-	3487-	3732-	3690-	3700-	3724-	3700-	3896-	3449-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3998-	3809-	3708-	3968-	3912-	3932-	3954-	3906-	4130-	3676-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4128-	3936-	3846-	4094-	4056-	4060-	4084-	4051-	4252-	3808-
SILURIAN-DEVONIAN CARBONATES	4148-	3968-	3878-	4120-	4076-	4086-	4112-	4072-	4278-	3839-
SALINA GROUP LOCKPORT DOLOMITE	4264- 5030-	4086- 4856-	3996- 4776-	4236- 5022-	4182- 4986-	4188- 4952-	4212- 4980-	4178- 4898-	4394- 5176-	4006- 4682-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5308- 5372-	5148- 5214-	5066- 5124-	5298- 5370-	5195- 5258-	5232- 5298-	5264- 5326-	5188- 5250-	5456- 5524-	5000- 5072-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5433- 5558- 5606-	5280- 5408- 5453-	5188- 5329- 5362-	5444- 5567- 5612-	5314- 5449- 5486-	5366- 5530- 5530-	5389- 5522- 5556-	5324- 5428- 5478-	5596- 5730- 5766-	5170- 5258- 5304-
QUEENSTON FORMATION	5618-	5469-	5374-	5623-	5498-	5542-	5667-	5492-	5777-	5322-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5471-5568	5332-5405	5236-5324	5485-5565	5361-5428	5427-5488	5438-5515	5356-5410	5641-5719	5179-5264
TOTAL DEPTH	5689	5575	5484	5710	5596	5672	5704	5580	5930	5417
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	340 Mcf AF 1,510 psi/72 hrs. development Beatty Run pool Coopersstown field	300 Mcf AF 1,350 psi/72 hrs. development Fakitzey pool Sugar Creek-Niles field	340 Mcf AF 1,400 psi/72 hrs. development Fakitzey pool Sugar Grove field	397 Mcf AF 1,500 psi/72 hrs. development Galloway pool Franklin-Dak Forest field	1,540 Mcf AF 1,475 psi/72 hrs. development Beatty Run pool Coopersstown field	7,500 Mcf AF 1,475 psi/72 hrs. development Beatty Run pool Coopersstown field	500 Mcf AF 1,470 psi/72 hrs. development Beatty Run pool Coopersstown field	850 Mcf AF 1,480 psi/72 hrs. development Wilson Mills pool Lake Creek field	450 Mcf AF 1,490 psi/72 hrs. development Galloway pool Franklin-Dak Forest field	4,500 Mcf AF 1,500 psi/72 hrs. development Beatty Run pool Coopersstown field

COUNTY Permit Number	Venango 121-41332	Venango 121-41425	Venango 121-41876	Venango 121-42239	Venango 121-42240	Venango 121-42263	Venango 121-42277	Venango 121-42288	Venango 121-42301	Venango 121-42305
NAME OF WELL	A. & K. Sumoske #1	Gaisford-Platt Unit #1	Lewis Panion #2	Wayne C. Joslyn #1	A. Gatto #1-A	Richard Bergin #2	J. & K. Geppert #1	James Oeets #1	Fox-Ward #1	Laddie Noel #3
OPERATOR	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Jackson	Jackson	Plum	Cherrytree	Jackson	Canal	Oakland	Canal	Oakland	Plum
QUADRANGLE	Oempseytown	Franklin	Oempseytown	Oempseytown	Sugar Lake	Utica	Oempseytown	Utica	Oempseytown	Oempseytown
LATITUDE	4,700 ft. S 41°32'30"	8,400 ft. S 41°30'00"	5,380 ft. S 41°37'30"	7,900 ft. S 41°37'30"	8,860 ft. S 41°35'00"	6,120 ft. S 41°30'00"	1,620 ft. S 41°32'30"	10,905 ft. S 41°30'00"	7,400 ft. S 41°32'30"	1,000 ft. S 41°35'00"
LONGITUDE	2,050 ft. W 79°50'00"	9,500 ft. W 79°47'30"	7,010 ft. W 79°45'00"	3,910 ft. W 79°45'00"	8,980 ft. W 79°52'30"	1,980 ft. W 79°55'00"	10,950 ft. W 79°45'00"	5,925 ft. W 79°55'00"	7,800 ft. W 79°47'30"	10,500 ft. W 79°50'00"
DATE COMPLETED	8-1-85	3-9-86	3-23-86	11-4-87	5-13-88	5-25-87	10-8-87	10-23-87	5-20-88	9-16-87
ELEVATION	1494 GR	1427 GR	1585 GR	1580 GR	1592 GR	1444 GR	1399 GR	1340 GP	1300 GR	1283 GR
LOGS RECEIVED AND LOGGED INTERVALS	LL/GR: 633-5708 COL/CNL/GR: 0-5712	OLL/GR: 50-5861 COL/CNL/GR: 50-5861 CBL: 5510-5827 INT: 626-950, 4130- 4400, 5500-5862		PCL: 5196-5522	PCL: 5190-5502	PCL: 5320-5631	COL/CNL/GR: 0-5666	GR/PCL: 5100-5433		PCL: 4877-5182
TULLY LIMESTONE	3780-	3894-	3738-	3764-	3735-		3720-	3556-	3610-	3388-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4013-	4136-	3987-	4014-	3946-		3970-	3784-	3854-	3611-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4142-	4258-	4133-	4154-	4094-		4094-	3920-	3977-	3768-
SILURIAN-DEVONIAN CARBONATES	4170-	4286-	4162-	4186-	4118-		4110-	3950-	4010-	3785-
SALINA GROUP LOCKPORT DOLOMITE	4270- 5026-	4406- 5178-	4463- 4845-	4472- 4875-	4430- 4842-		4221- 5065-	4286- 4754-	4165- 4840-	4088- 4531-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5307- 5374-	5461- 5534-	5205- 5272-	5239- 5299-	5192- 5255-	5367-	5298- 5337-	5110- 5177-	5162- 5232-	4894- 4952-
GRIMSBY FORMATION CARBON HEAD SHALE WHIRLPOOL SANDSTONE	5437- 5568- 5600-	5602- 5722- 5772-	5331- 5162- 5196-	5358- 5438- 5522-	5310- 5456- 5485-	5427- 5570- 5606-	5404- 5525- 5568-	5240- 5381- 5410-	5331- 5418- 5466-	5010- 5146- 5178-
QUEENSTON FORMATION	5611-	5782-	5504-	5534-	5498-	5618-	5577-	5426-	5475-	5194-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5493-5564	5650-5713	5368-5420	5422-5446	5370-5399	5487-5512	5442-5520	5293-5316	5345-5414	5062-5092
TOTAL DEPTH	5725	5875	5569	5570	5538	5681	5671	5489	5510	5254
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	3,700 Mcf AF 1,500 psi/72 hrs. development Beatty Run pool Cooperstown field	539 Mcf AF 1,475 psi/72 hrs. development Beatty Run pool Cooperstown field	519 Mcf AF 1,450 psi/48 hrs. development Gresham pool Breedtown field	550 Mcf AF 1,150 psi/48 hrs. development Gresham pool Breedtown field	550 Mcf AF 1,250 psi/48 hrs. development Wilson Mills pool Lake Creek field	550 Mcf AF 1,100 psi/48 hrs. development Canal pool McCune Run field	400 Mcf AF 1,485 psi/72 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,225 psi/48 hrs. development Takitezy pool Suar Creek-Niles field	90 Mcf AF 1,475 psi/72 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,175 psi/48 hrs. development Beatty Run pool Cooperstown field

Figure 35. (Continued).

COUNTY Permit Number	Venango 121-42320	Venango 121-42322	Venango 121-42324	Venango 121-42331	Venango 121-42338	Venango 121-42357	Venango 121-42358	Venango 121-42359	Venango 121-42361	Venango 121-42363
NAME OF WELL	Don Fredrick #1	Virginia Allender #1	W.J. Rock #1	Nelson #1	Snyder-Greenlee Unit #1	Gioffre/Snyder #1	Gerald F. Fisher #3	Virginia Minnamon #1	David Wagner #3	Airport #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Quaker State Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Quaker State Corporation
TOWNSHIP	Cherrytree	Cherrytree	Canal	Cherrytree	Sugaroreck	Jackson	Jackson	Oakland	Canal	Cherrytree
QUADRANGLE	Titusville South	Titusville South	Sugar Lake	Oempseytown	Utica	Franklin	Franklin	Oempseytown	Utica	Titusville South
LATITUDE	14,820 ft. S 41°35'00"	13,850 ft. S 41°32'30"	11,700 ft. S 41°32'30"	8,480 ft. S 41°37'30"	11,000 ft. S 41°30'00"	9,940 ft. S 41°30'00"	8,450 ft. S 41°30'00"	14,570 ft. S 41°35'00"	9,420 ft. S 41°30'00"	8,480 ft. S 41°37'30"
LONGITUDE	11,050 ft. W 79°40'00"	2,120 ft. W 79°42'30"	3,120 ft. W 79°55'00"	2,200 ft. W 79°45'00"	3,600 ft. W 79°52'30"	11,210 ft. W 79°50'00"	3,480 ft. W 79°50'00"	11,170 ft. W 79°45'00"	6,980 ft. W 79°57'30"	8,400 ft. W 79°42'30"
DATE COMPLETED	10-27-87	10-8-87	7-28-88	10-22-87	9-22-87	2-16-88	9-16-88	10-7-87	12-18-87	10-13-87
ELEVATION	1480 GR	1450 GR	1510 GR	1505 GR	1095 GR	1330 GR	1322 GR	1405 GR	1140 GR	1520 GR
LOGS RECEIVED AND LOGGED INTERVALS			GR/PCL: 5280-5590		COL/CNL/GR: 0-3459	GR/PCL: 0-5651		PCL: 5282-5590	PCL: 4952-5280	
TULLY LIMESTONE	3886-	3740-	3748-	3718-	3476-	3740-	3750-	3722-	3393-	3759-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4155-	4002-	3968-	3972-	3698-	3966-	3986-	3972-	3612-	4020-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4271-	4128-	4103-	4110-	3828-	4092-	4112-	4097-	3756-	4156-
SILURIAN-DEVONIAN CARBONATES	4296-	4150-	4134-	4140-	3846-	4123-	4143-	4028-	3786-	4179-
SALINA GROUP LOCKPORT DOLOMITE	4630- 5096-	4464- 4890-	4452- 4910-	4270- 4898-	3076- 4854-	4301- 4969-	4482- 4960-	4448- 4910-	4115- 4590-	4314- 4960-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5455- 5526-	5250- 5319-	5276- 5338-	5126- 5262-	5038- 5100-	5290- 5360-	5318- 5384-	5274- 5332-	4953- 5012-	5175- 5313-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5590- 5731- 5761-	5380- 5518- 5545-	5396- 5536- 5571-	5320- 5447- 5483-	5164- 5304- 5343-	5462- 5534- 5602-	5452- 5580- 5620-	5397- 5530- 5555-	5068- 5223- 5256-	5372- 5498- 5535-
QUEENSTON FORMATION	5770-	5555-	5582-	5492-	5350-	5620-	5636-	5572-	5270-	5544-
PRODUCING FORMATION	Medina	Medina	Lockport	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5634-5652	5438-5464	5214-5263	5365-5491	5219-5287	5472-5558	5496-5517	5456-5486	5155-5177	5414-5542
TOTAL DEPTH	5840	5608	5635	5611	5490	5675	5700	5603	5350	5654
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	600 Mcf AF 1,375 psi/48 hrs. development Cherrytree Run pool Toonerville field	550 Mcf AF 1,425 psi/48 hrs. development Gresham pool Breedtown field	600 Mcf AF 1,140 psi/48 hrs. Shallow pool discovery Oration Hill pool Coopersatston field	1,300 Mcf AF 1,450 psi/86 hrs. development Gresham pool Breedtown field	216 Mcf AF 1,485 psi/48 hrs. development Beatty Run pool Cooperstown field	315 Mcf AF 1,485 psi/72 hrs. development Beatty Run pool Cooperstown field	650 Mcf AF 1,400 psi/48 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,280 psi/48 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,325 psi/48 hrs. development Canal pool Mechan Run field	1,200 Mcf AF 1,425 psi/152 hrs. development Gresham pool Breedtown field

COUNTY Permit Number	Venango 121-42364	Venango 121-42367	Venango 121-42368	Venango 121-42370	Venango 121-42371	Venango 121-42372 et al #3	Venango 121-42373	Venango 121-42374	Venango 121-42381	Venango 121-42382
NAME OF WELL	Windy Hills #1	Kinley Nichols #1	Suresh C. Chugh #1	Thomas Hefferman #2	Lyle Shaffstall #1	Allen Shuffstall, et al #3	Lewis W. Meyers #1	George Way #2	September Corp. #1-A	Richard Deets #1
OPERATOR	Quaker State Corporation	Quaker State Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Cherrytree	Cherrytree	Canal	Canal	Canal	Jackson	Canal	Oakland	Plum	Canal
QUADRANGLE	Titusville South	Titusville South	Sugar Lake	Utica	Sugar Lake	Sugar Lake	Utica	Dempseytown	Dempseytown	Utica
LATITUDE	4,050 ft. S 41°35'00"	2,000 ft. S 41°35'00"	8,400 ft. S 41°32'30"	7,860 ft. S 41°30'00"	8,390 ft. S 41°32'30"	10,550 ft. S 41°32'30"	5,400 ft. S 41°27'30"	9,200 ft. S 41°32'30"	10,155 ft. S 41°35'00"	7,680 ft. S 41°30'00"
LONGITUDE	7,900 ft. W 79°40'00"	2,450 ft. W 79°42'30"	5,420 ft. W 79°52'30"	2,920 ft. W 79°55'00"	8,020 ft. W 79°55'00"	5,050 ft. W 79°52'30"	3,400 ft. W 79°55'00"	4,400 ft. W 79°47'30"	8,345 ft. W 79°45'00"	1,000 ft. W 79°57'30"
DATE COMPLETED	11-13-87	11-19-87	10-21-87	9-30-87	10-20-87	10-7-87	10-29-87	10-14-87	10-6-87	12-16-87
ELEVATION	1520 GR	1550 GR	1490 GR	1500 GR	1545 GR	1392 GR	1500 GR	1448 GR	1360 GR	1340 GR
LOGS RECEIVED AND LOGGED INTERVALS			PCL: 5250-5560	GR/PCL: 5200-5670	OB/L/VOL: 4390-5608	PCL: 5196-5525	PCL: 5510-5827	PCL: 5398-5695	PCL: 5196-5512	PCL: 3500-5483
TULLY LIMESTONE	3870-	3835-	3671-	3810-	3733-	3681-	3932-	3795-	3646-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4138-	4101-	3906-	4035-	3956-	3905-	4137-	4040-	3900-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4254-	4221-	4047-	4174-	4100-	4041-	4260-	4115-	4027-	
SILURIAN-DEVONIAN CARBONATES	4264-	4247-	4080-	4206-	4132-	4068-	4288-	4194-	4058-	
SALINA GROUP LOCOPOL DOLOMITE	4429- 5121-	4385- 5065-	4398- 4860-	4538- 5006-	4450- 4917-	4400- 4860-	4624- 5110-	4518- 4990-	4369- 4820-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5321- 5477-	5268- 5420-	5224- 5282-	5370- 5432-	5230- 5340-	5216- 5280-	5470- 5541-	5372- 5421-	5178- 5242-	5230-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5542- 5670- 5706-	5484- 5618- 5646-	5342- 5484- 5515-	5496- 5640- 5663-	5396- 5540- 5575-	5340- 5426- 5511-	5650- 5756- 5784-	5487- 5624- 5650-	5303- 5440- 5468-	5230- 5432- 5467-
QUEENSTON FORMATION	5719-	5658-	5528-	5672-	5583-	5527-	5796-	5668-	5480-	5479-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5584-5717	5520-5656	5389-5426	5186-5233	5453-5490	5394-5426	5636-5695	5540-5572	5364-5378	5333-5431
TOTAL DEPTH	5841	5790	5605	5734	5650	5587	5857	5750	5543	5544
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,300 Mcf AF 1,450 psi/340 hrs. development Cherrytree Run pool Tonerville field	1,200 Mcf AF 1,480 psi/1116 hrs. extension Iecza pool Hamilton Corners field	600 Mcf AF 1,025 psi/148 hrs. development Deckard pool Cochranon field	600 Mcf AF 1,010 psi/148 hrs. development Canal pool McCine Run field	650 Mcf AF 1,125 psi/148 hrs. development Deckard pool Cochranon field	600 Mcf AF 1,030 psi/148 hrs. development Beatty Run pool Cooperstown field	650 Mcf AF 1,280 psi/148 hrs. development Talliezy pool Sugar Creek-Niles field	600 Mcf AF 800 psi/148 hrs. development Beatty Run pool Cooperstown field	650 Mcf AF 1,150 psi/148 hrs. extension Tenison pool Hamilton Corners field	550 Mcf AF 1,240 psi/148 hrs. development Cabo pool McCine Run field

Figure 35. (Continued).

COUNTY Permit Number	Venango 121-42383	Venango 121-42385	Venango 121-42387	Venango 121-42388	Venango 121-42389	Venango 121-42391	Venango 121-42392	Venango 121-42393	Venango 121-42394	Venango 121-42395
NAME OF WELL	William M. McCune #1	G. Whetzel #1	Carl Carey #1	Carl Carey #2	Elmer R. Brown #2-A	R.L. Rosenberger #1	Norris J. Buchanan #1	George Way #3	Ralph Whitmer #4-A	Elmer R. Brown #4-A
OPERATOR	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Canal	Jackson	Plum	Cherrytree	Jackson	Oakland	Oakland	Oakland	Jackson	Jackson
QUADRANGLE	Utica	Oempseytown	Oempseytown	Oempseytown	Sugar Lake	Oempseytown	Oempseytown	Oempseytown	Franklin	Sugar Lake
LATITUDE	490 ft. S 41°27'30"	14,100 ft. S 41°35'00"	7,480 ft. S 41°37'30"	6,040 ft. S 41°37'30"	10,600 ft. S 41°35'00"	13,090 ft. S 41°32'30"	10,590 ft. S 41°35'00"	11,260 ft. S 41°32'30"	4,410 ft. S 41°30'00"	12,580 ft. S 41°35'00"
LONGITUDE	10,950 ft. W 79°55'00"	4,600 ft. W 79°50'00"	7,450 ft. W 79°45'00"	3,440 ft. W 79°45'00"	6,310 ft. W 79°52'30"	3,710 ft. W 79°47'30"	6,390 ft. W 79°45'00"	4,480 ft. W 79°47'30"	9,680 ft. W 79°50'00"	7,900 ft. W 79°52'30"
DATE COMPLETED	11-19-87	12-21-87	11-11-87	11-3-87	10-28-87	11-12-87	11-6-87	11-10-87	11-17-87	12-8-87
ELEVATION	1257 GR	1372 GR	1545 GR	1551 GR	1355 GR	1355 GR	1374 GR	1255 GR	1135 GR	1308 GR
LOGS RECEIVED AND LOGGED INTERVALS	PCL: 5190-5495	GR/PCL: 5250-5454	PCL: 5200-5524	PCL: 5138-5527	PCL: 5020-5327	PCL: 5300-5620	PCL: 5217-5522	PCL: 5210-5530	CBL/VOL: 4100-5312	PCL: 4960-5267
TULLY LIMESTONE	3582-	3604-	3725-	3781-	3536-	3742-	3665-	3631-	3484-	3462-
ONONAGA LIMESTONE HUNTERSVILLE CHERT	3808-	3834-	3978-	3884-	3758-	3986-	3919-	3864-	3712-	3694-
ONISKANY SANDSTONE RIDGELEY SANDSTONE	3944-	3967-	4124-	4125-	3900-	4105-	4048-	3997-	3844-	3837-
SILURIAN-DEVONIAN CARBONATES	3978-	3999-	4152-	4150-	3933-	4136-	4076-	4027-	3876-	3872-
SALINA GROUP LOCKPORT OOOLITE	4310- 4780-	4145- 4792-	4440- 4840-	4450- 4850-	4240- 4670-	4471- 4950-	4386- 4843-	4354- 4834-	4213- 4684-	4174- 4608-
ROCHESTER SHALE IRONDEQUOIT OOOLITE	5153- 5215-	5116- 5130-	5194- 5260-	5207- 5272-	5024- 5067-	5308- 5378-	5197- 5266-	5187- 5260-	5042- 5111-	4971- 5025-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5277- 5426- 5454-	5280- 5349- 5408-	5318- 5448- 5481-	5330- 5470- 5496-	5143- 5282- 5312-	5444- 5582- 5605-	5329- 5471- 5496-	5327- 5458- 5491-	5178- 5205- 5344-	5082- 5205- 5251-
QUEENSTON FORMATION	5466-	5419-	5491-	5505-	5329-	5623-	5507-	5505-	5362-	5266-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5326-5390	5286-5350	5360-5404	5367-5425	5180-5221	5482-5526	5376-5418	5347-5414	5232-5258	5119-5148
TOTAL DEPTH	5539	5530	5555	5568	5392	5686	5570	5570	5414	5340
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	650 Mcf AF 1,050 psi/48 hrs. development Canal McCune Run field	145 Mcf AF 1,475 psi/72 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,050 psi/48 hrs. development Gresham Breedtown field	600 Mcf AF 1,250 psi/48 hrs. development Gresham pool Breedtown field	550 Mcf AF 1,240 psi/48 hrs. development Wilson Mills pool Lake Creek field	650 Mcf AF 1,070 psi/48 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,300 psi/48 hrs. development Tecca pool Hamilton Corners field	600 Mcf AF 1,330 psi/48 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,300 psi/48 hrs. development Beatty Run pool Cooperstown field	780 Mcf AF 1,145 psi/48 hrs. development Beatty Run pool Cooperstown field

COUNTY Permit Number	Venango 121-42396	Venango 121-42399	Venango 121-42400	Venango 121-42401	Venango 121-42402	Venango 121-42403	Venango 121-42404	Venango 121-42407	Venango 121-42408	Venango 121-42409
NAME OF WELL	Ellwood L. Horn #1	Dean Ford #2	Raymond L. Cooper #2	J. Mueller #1	Willis C. Marshall #1-A	Alan C. Bowman #2	Frank C. Woolstrum #4	Say Unit #2	W. & V. Wilcox #2	Patricia Kammerer #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Oakland	Cherrytree	Plum	Jackson	Cherrytree	Cherrytree	Jackson	Oakland	Plum	Plum
QUADRANGLE	Franklin	Oempseytown	Oempseytown	Sugar Lake	Titusville South	Oempseytown	Sugar Lake	Oempseytown	Oempseytown	Sugar Lake
LATITUDE	2,320 ft. S 41°30'00"	7,010 ft. S 41°37'30"	2,520 ft. S 41°35'00"	10,150 ft. S 41°35'00"	2,730 ft. S 41°32'30"	5,510 ft. S 41°37'30"	2,520 ft. S 41°32'30"	13,300 ft. S 41°35'00"	5,950 ft. S 41°35'00"	3,710 ft. S 41°35'00"
LONGITUDE	10,030 ft. W 79°45'00"	1,510 ft. W 79°45'00"	2,760 ft. W 79°50'00"	3,260 ft. W 79°52'30"	8,520 ft. W 79°42'30"	475 ft. W 79°45'00"	3,700 ft. W 79°52'30"	1,700 ft. W 79°47'30"	9,950 ft. W 79°50'00"	1,040 ft. W 79°52'30"
DATE COMPLETED	7-21-88	12-17-87	11-24-87	11-17-87	11-18-87	11-24-87	11-2-87	1-14-88	12-17-87	2-13-88
ELEVATION	1510 GR	1480 GR	1472 GR	1512 GR	1540 GR	1491 GR	1233 GR	1212 GR	1318 GR	1486 GR
LOGS RECEIVED AND LOGGED INTERVALS		PCL: 5100-5484	PCL: 5100-5422	PCL: 5163-5531		PCL: 5170-5374	PCL: 4994-5302	PCL: 5150-5406	PCL: 0-5292	PCL: 5100-5411
TULLY LIMESTONE	3970-	3685-	3642-	2697-	3932-		3451-	3504-	3434-	3604-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4218-	3940-	3873-	3917-	4193-		3677-	3754-	3662-	3824-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4337-	4074-	4009-	4060-	4310-		3816-	3881-	3802-	3967-
SILURIAN-DEVONIAN CARBONATES	4363-	4104-	4037-	4094-	4337-		3845-	3912-	3828-	3993-
SALINA GROUP LOCKPORT DOLOMITE	4706- 5176-	4400- 4794-	4333- 4774-	4393- 4847-	4666- 5122-		4155- 4609-	4058- 4716-	3970- 4614-	4295- 4752-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5538- 5610-	5163- 5225-	5131- 5196-	5212- 5266-	5480- 5564-	5234-	5000- 5038-	5032- 5102-	4930- 4996-	5117- 5169-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5677- 5814- 5840-	5285- 5413- 5447-	5256- 5389- 5420-	5324- 5457- 5490-	5630- 5769- 5794-	5292- 5412- 5458-	5096- 5234- 5266-	5212- 5271- 5330-	5087- 5160- 5223-	5226- 5354- 5394-
QUEENSTON FORMATION	5858-	5457-	5432-	5502-	5806-	5467-	5280-	5339-	5234-	5407-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5735-5750	5331-5358	5299-5341	5346-5380	5685-5711	5348-5375	5156-5190	5217-5279	5099-5156	5278-5312
TOTAL DEPTH	5918	5520	5474	5557	5876	5519	5347	5671	5351	5474
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	550 Mcf AF 1,400 psi/48 hrs. development Mt. Carmel pool Oempseytown field	600 Mcf AF 1,000 psi/48 hrs. development Gresham pool Breedtown field	550 Mcf AF 1,420 psi/48 hrs. development Beatty Run pool Cooperstown field	650 Mcf AF 1,445 psi/48 hrs. development Wilson Mills pool Lake Creek field	500 Mcf AF 1,190 psi/48 hrs. development Tecza pool Hamilton Corners field	550 Mcf AF 1,475 psi/48 hrs. development Gresham pool Breedtown field	600 Mcf AF 1,425 psi/48 hrs. development Beatty Run pool Cooperstown field	113 Mcf AF 1,450 psi/72 hrs. development Beatty Run pool Cooperstown field	300 Mcf AF 1,475 psi/72 hrs. development Wilson Mills pool Lake Creek field	600 Mcf AF 1,230 psi/48 hrs. development Wilson Mills pool Lake Creek field

Figure 35. (Continued).

COUNTY Permit Number	Venango 121-42410	Venango 121-42411	Venango 121-42413	Venango 121-42414	Venango 121-42415	Venango 121-42417	Venango 121-42418	Venango 121-42419	Venango 121-42421	Venango 121-42422
NAME OF WELL	Calvin P. Krepps #1	Lester P. Reitz #2	Jones-Spangler Unit #1	D. & P. Bonner #1	Matthews-Wagner Unit #1	R. & E. Koger #2	Carl R. Proper #3	Norris J. Buchanan #2	Edgar Staub #2	Allen C. Bowman #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Plum	Oakland	Plum	Plum	Plum	Plum	Plum	Oakland	Cherrytree	Cherrytree
QUADRANGLE	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Titusville South	Titusville South
LATITUDE	14,000 ft. S 41°37'30"	13,200 ft. S 41°32'30"	9,125 ft. S 41°35'00"	12,400 ft. S 41°35'00"	13,000 ft. S 41°35'00"	14,300 ft. S 41°37'30"	11,040 ft. S 41°37'30"	12,610 ft. S 41°35'00"	12,250 ft. S 41°37'30"	8,140 ft. S 41°37'30"
LONGITUDE	2,530 ft. W 79°50'00"	5,880 ft. W 79°47'30"	9,775 ft. W 79°47'30"	6,300 ft. W 79°47'30"	1,950 ft. W 79°50'00"	11,250 ft. W 79°45'00"	2,320 ft. W 79°50'00"	5,970 ft. W 79°45'00"	400 ft. W 79°42'30"	10,100 ft. W 79°42'30"
DATE COMPLETED	12-12-87	12-17-87	2-25-88	1-28-88	2-5-88	12-28-87	12-1-87	2-10-88	2-18-88	2-9-88
ELEVATION	1511 GR	1398 GR	1486 GR	1415 GR	1365 GR	1483 GR	1502 GR	1400 GR	1450 GR	1523 GR
LOGS RECEIVED AND LOGGED INTERVALS	PCL: 5089-5418	PCL: 5390-5696	PCL: 5350-5566	PCL/GR: 5270-5603	PCL/GR: 5150-5471	PCL/GR: 5350-5489	PCL: 5100-5417	GR/PCL: 5260-5564		PCL: 5200-5428
TULLY LIMESTONE		3730-	3726-	3706-	3594-	3714-			3738-	3734-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT		4022-	3964-	3949-	3827-	3963-			4002-	3990-
ORISKANY SANDSTONE RIDGELEY SANDSTONE		4144-	3996-	4076-	3958-	4100-			4130-	4125-
SILURIAN-DEVONIAN CARBONATES		4176-	4124-	4107-	3988-	4128-			4159-	4158-
SALINA GROUP LOCKPORT DOLOMITE		4508- 4980-	4216- 4902-	4255- 4896-	4137- 4778-	4268- 4862-			4457- 4895-	4456- 4860-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5116- 5182-	5333- 5410-	5224- 5290-	5222- 5284-	5100- 5164-	5187- 5248-	5153-	5324-	5250- 5321-	5220- 5286-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5242- 5353- 5410-	5477- 5614- 5644-	5392- 5442- 5520-	5380- 5453- 5511-	5258- 5325- 5393-	5338- 5402- 5472-	5213- 5344- 5380-	5385- 5512- 5552-	5383- 5518- 5540-	5345- 5476- 5508-
QUEENSTON FORMATION	5467-	5658-	5529-	5523-	5403-	5482-	5390-	5563-	5655-	5519-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5280-5320	5519-5555	5405-5460	5401-5460	5270-5340	5371-5408	5256-5307	5443-5472	5422-5479	5380-5415
TOTAL DEPTH	5500	5728	5603	5624	5504	5550	5474	5602	5655	5585
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	550 Mcf AF 1,350 psi/48 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,400 psi/48 hrs. development Beatty Run pool Cooperstown field	90 Mcf AF 1,420 psi/72 hrs. development Beatty Run pool Cooperstown field	330 Mcf AF 1,485 psi/72 hrs. development Beatty Run pool Cooperstown field	500 Mcf AF 1,550 psi/72 hrs. development Beatty Run pool Cooperstown field	73 Mcf AF 1,455 psi/72 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,175 psi/48 hrs. extension Diamond pool Froy field	600 Mcf AF 1,425 psi/48 hrs. development Iezca pool Hamilton field	600 Mcf AF 1,300 psi/48 hrs. development Gresham pool Breadtown field	600 Mcf AF 1,170 psi/48 hrs. development Gresham pool Breadtown field

COUNTY	Permit Number	Venango 121-42424	Venango 121-42425	Venango 121-42426	Venango 121-42429	Venango 121-42430	Venango 121-42431	Venango 121-42434	Venango 121-42435	Venango 121-42436	Venango 121-42437
NAME OF WELL	B. Conway #1	Mineral Consulting Services, Inc. #1	J. & M. Russell #1	Oean Ford #1	Ralph W. Whitmer #5-A	Ronald E. Blake #2	F. & E. Bell #2	Edward Threlfall Jr. #1	Elizabeth J. Ellen #1	Robert L. Lowry #1	
OPERATOR	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	
TOWNSHIP	Plum	Plum	Plum	Cherrytree	Jackson	Oakland	Plum	Cherrytree	Cherrytree	Cherrytree	
QUADRANGLE	Oempseytown	Oempseytown	Oempseytown	Oempseytown	Franklin	Oempseytown	Oempseytown	Titusville South	Titusville South	Titusville South	
LATITUDE	5,350 ft. S 41°35'00"	11,900 ft. S 41°37'30"	1,350 ft. S 41°32'30"	8,730 ft. S 41°37'30"	5,900 ft. S 41°30'00"	10,230 ft. S 41°32'30"	7,300 ft. S 41°35'00"	10,180 ft. S 41°37'30"	11,400 ft. S 41°35'00"	8,170 ft. S 41°35'00"	
LONGITUDE	9,200 ft. W 79°45'00"	8,950 ft. W 79°45'00"	7,600 ft. W 79°47'30"	1,290 ft. W 79°45'00"	8,680 ft. W 79°50'00"	9,020 ft. W 79°47'30"	9,250 ft. W 79°50'00"	1,920 ft. W 79°42'30"	1,670 ft. W 79°42'30"	4,950 ft. W 79°42'30"	
DATE COMPLETED	1-19-88	1-19-88	7-11-88	12-3-87	12-8-87	12-12-87	1-13-88	5-13-88	9-30-88	9-7-88	
ELEVATION	1384 GR	1457 GR	1422 GR	1455 GR	1185 GR	1199 GR	1242 GR	1515 GR	1404 GR	1535 GR	
LOGS RECEIVED AND LOGGED INTERVALS	PCL/GR: 5200-5528	PCL/GR: 5250-5484		PCL: 0-5408	PCL: 5000-5428	PCL: 5000-5408	PCL/GR: 5050-5289				
TULLY LIMESTONE	3654-	3674-	3886-				3412-	3778-	3782-	3881-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3907-	3922-	3928-				3642-	4040-	4046-	4140-	
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4037-	4064-	4052-				3782-	4170-	4165-	4262-	
SILURIAN-DEVONIAN CARBONATES	4064-	4092-	4092-				3809-	4198-	4192-	4289-	
SALINA GROUP LOCKPORT DOLOMITE	4213- 4828-	4228- 4822-	4238- 4892-				3954- 4594-	4499- 4924-	4508- 4978-	4608- 5058-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5146- 5212-	5138- 5208-	5222- 5286-	5130- 5198-	5184-	5088- 5157-	4915- 4981-	5282- 5348-	5336- 5407-	5418- 5480-	
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5303- 5395- 5440-	5306- 5375- 5432-	5367- 5488- 5528-	5261- 5393-	5251- 5386- 5420-	5224- 5362- 5388-	5091- 5134- 5205-	5410- 5544- 5572-	5470- 5604- 5638-	5544- 5680- 5707-	
QUEENSTON FORMATION	5452-	5442-	5538-		5436-	5400-	5216-	5582-	5650-	5721-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	
PRODUCING INTERVAL	5327-5404	5323-5392	5390-5467	5312-5344	5299-5325	5262-5280	5094-5145	5422-5469	5508-5548	5596-5622	
TOTAL DEPTH	5570	5520	5615	5490	5490	5445	5370	5661	5720	5787	
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	
RESULTS	415 Mcf AF 1,485 psi/72 hrs. development Beatty Run pool Cooperstown field	433 Mcf AF 1,475 psi/72 hrs. development Gresham pool Breedtown field	233 Mcf AF 1,375 psi/72 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,325 psi/48 hrs. development Gresham pool Breedtown field	600 Mcf AF 1,250 psi/48 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,200 psi/48 hrs. development Beatty Run pool Cooperstown field	85 Mcf AF 1,475 psi/72 hrs. development Wilson Mills pool Lake Creek field	600 Mcf AF 1,425 psi/48 hrs. development Gresham pool Breedtown field	650 Mcf AF 1,490 psi/48 hrs. development Tecca pool Hamilton Corners field	450 Mcf AF 1,300 psi/48 hrs. development Tecca pool Hamilton Corners field	

Figure 35. (Continued).

COUNTY	Permit Number	Venango 121-42439	Venango 121-42440	Venango 121-42444	Venango 121-42445	Venango 121-42447	Venango 121-42449	Venango 121-42451	Venango 121-42454	Venango 121-42457	Venango 121-42460
NAME OF WELL		David L. Winger #1	George S. McPheters #2	J & R Copley #1	I. Strawbridge #1	G. Harrison #2	McGinnis Unit #1	Delmont L. Wilson #1	Laddie Noel #4	Gifford Unit #1	Eugene W. Gettig #1
OPERATOR		Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation
TOWNSHIP		Oakland	Plum	Plum	Plum	Cherrytree	Plum	Plum	Plum	Plum	Cherrytree
QUADRANGLE		Dempseytown	Dempseytown	Dempseytown	Dempseytown	Titusville South	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Titusville South
LATITUDE		14,200 ft. S 41°32'30"	14,820 ft. S 41°37'30"	5,650 ft. S 41°35'00"	5,900 ft. S 41°37'30"	5,950 ft. S 41°37'30"	7,500 ft. S 41°35'00"	4,320 ft. S 41°35'00"	500 ft. S 41°35'00"	8,100 ft. S 41°35'00"	350 ft. S 41°35'00"
LONGITUDE		9,750 ft. W 79°45'00"	6,420 ft. W 79°50'00"	7,550 ft. W 79°45'00"	10,250 ft. W 79°45'00"	10,080 ft. W 79°42'30"	8,150 ft. W 79°47'30"	1,380 ft. W 79°50'00"	8,850 ft. W 79°50'00"	8,750 ft. W 79°45'00"	8,730 ft. W 79°40'00"
DATE COMPLETED		3-1-88	1-6-88	7-27-88	3-10-88	2-10-88	3-15-88	9-14-88	8-19-88	2-29-88	8-30-88
ELEVATION		1455 GR	1360 GR	1286 GR	1501 GR	1535 GR	1513 GR	1469 GR	1277 GR	1295 GR	1532 GR
LOGS RECEIVED AND LOGGED INTERVALS		PCL: 5450-5785	PCL: 4934-5234			PCL: 5200-5447				PCL/OR: 5150-5406	
TULLY LIMESTONE		3880-		3578-	3658-	3732-	3770-	3662-	3389-	3576-	3855-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT		4128-		3834-	3906-	3986-	4010-	3893-	3612-	3830-	4121-
ORISKANY SANDSTONE RIDGELEY SANDSTONE		4246-		3960-	4050-	4120-	4142-	4029-	3756-	3964-	4243-
SILURIAN-DEVONIAN CARBONATES		4274-		3988-	4079-	4150-	4170-	4057-	3782-	3997-	4368-
SALINA GROUP LOCKPORT DOLOMITE		4622- 5090-		4136- 4746-	4211- 4814-	4445- 4833-	4319- 4932-	4366- 4790-	4083- 4520-	4140- 4766-	4576- 5028-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		5454- 5522-	4933- 4998-	5066- 5128-	5130- 5198-	5210- 5277-	5220- 5320-	5146- 5151-	4880- 4942-	5081- 5151-	5376- 5446-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE		5589- 5735- 5760-	5006- 5186- 5222-	5226- 5318- 5357-	5289- 5385- 5422-	5336- 5471- 5495-	5420- 5495- 5546-	5272- 5400- 5435-	5001- 5135- 5168-	5245- 5326- 5380-	5508- 5644- 5673-
QUEENSTON FORMATION		5770-	5232-	5370-	5434-	5509-	5558-	5447-	5182-	5391-	5686-
PRODUCING FORMATION		Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL		5648-5690	5089-5138	5232-5293	5297-5376	5374-5410	5423-5490	5318-5349	5036-5076	5251-5322	5565-5595
TOTAL DEPTH		5838	5320	5440	5499	5570	5638	5520	5248	5465	5749
DEEPEST FORMATION REACHED		Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS		500 Mcf AF 1,350 psi/48 hrs. development Mt. Carmel Dempseytown field	550 Mcf AF 1,260 psi/48 hrs. development Beatty Run Cooperstown field	430 Mcf AF 1,475 psi/72 hrs. development Beatty Run Cooperstown field	400 Mcf AF 1,485 psi/72 hrs. development Gresham Breedtown field	550 Mcf AF 1,100 psi/48 hrs. development Gresham Breedtown field	333 Mcf AF 1,485 psi/72 hrs. development Beatty Run Cooperstown field	560 Mcf AF 1,375 psi/48 hrs. development Beatty Run Cooperstown field	550 Mcf AF 950 psi/48 hrs. development Wilson Mills Lake Creek field	370 Mcf AF 1,480 psi/72 hrs. development Tecza Hamilton Corners field	550 Mcf AF 1,200 psi/48 hrs. development Gresham Breedtown field

COUNTY Permit Number	Venango 121-42461	Venango 121-42463	Venango 121-42465	Venango 121-42467	Venango 121-42481	Venango 121-42482	Venango 121-42483	Venango 121-42484	Venango 121-42487	Venango 121-42489
NAME OF WELL	Edna Mallory #1	F. R. Schwaenbauer #2	Strawbridge #2	Michael Shevchik #2	Eugene Williams #1	Kenneth G. Grundan #1	Miles B. Hanson #1	Walter Metzgar #1	Daniel E. Hovis #1	Ralph Mitchell #4-A
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Cherrytree	Cherrytree	Plum	Plum	Oakland	Cherrytree	Oakland	Plum	Oakland	Jackson
QUADRANGLE	Titusville South	Titusville South	Oempseytown	Oempseytown	Oempseytown	Titusville South	Franklin	Oempseytown	Franklin	Utica
LATITUDE	2,030 ft. S 41°35'00"	1,920 ft. S 41°32'30"	9,600 ft. S 41°37'30"	1,800 ft. S 41°35'00"	13,530 ft. S 41°32'30"	5,500 ft. S 41°35'00"	1,390 ft. S 41°30'00"	4,270 ft. S 41°37'30"	280 ft. S 41°30'00"	4,380 ft. S 41°30'00"
LONGITUDE	9,580 ft. W 79°40'00"	10,260 ft. W 79°42'30"	8,100 ft. W 79°45'00"	9,520 ft. W 79°45'00"	680 ft. W 79°47'30"	4,460 ft. W 79°42'30"	1,970 ft. W 79°47'30"	5,420 ft. W 79°45'00"	370 ft. W 79°47'30"	570 ft. W 79°52'30"
DATE COMPLETED	6-28-88	9-10-88	8-24-88	6-30-88	6-28-88	6-8-88	7-8-88	7-28-88	7-19-88	6-21-88
ELEVATION	1540 GR	1522 GR	1530 GR	1489 GR	1375 GR	1595 GR	1495 GR	1591 GR	1420 GR	1106 GR
LOGS RECEIVED AND LOGGED INTERVALS						CBL/VOL: 4000-5739				CBL/VOL: 3550-5265
TULLY LIMESTONE	3861-	3904-	3720-	3740-	3784-	3927-	3928-	3749-	3846-	3947-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4128-	4163-	3968-	3990-	4032-	4190-	4174-	4000-	4095-	3672-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4247-	4288-	4108-	4126-	4150-	4309-	4294-	4145-	4216-	3801-
SILURIAN-DEVONIAN CARBONATES	4274-	4304-	4138-	4154-	4178-	4339-	4322-	4170-	4244-	3834-
SALINA GROUP LOCKPORT DOLOMITE	4583- 5029-	4638- 5102-	4270- 4856-	4454- 4860-	4517- 4986-	4654- 5087-	4673- 5126-	4461- 4856-	4577- 5039-	4165- 4849-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5384- 5460-	5465- 5536-	5176- 5242-	5268- 5285-	5348- 5420-	5444- 5516-	5485- 5558-	5216- 5282-	5402- 5471-	5114- 5178-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5524- 5658- 5692-	5600- 5741- 5768-	5339- 5379- 5466-	5345- 5476- 5509-	5487- 5630- 5503-	5577- 5718- 5745-	5626- 5766- 5795-	5338- 5468- 5503-	5538- 5678- 5708-	5192- 5278- 5312-
QUEENSTON FORMATION	5702-	5779-	5479-	5520-	5666-	5755-	5806-	5513-	5720-	5332-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5579-5616	5667-5686	5343-5416	5391-5426	5529-5554	5621-5661	5673-5706	5394-5418	5582-5617	5182-5209
TOTAL DEPTH	5760	5850	5571	5581	5725	5822	5880	5583	5790	5420
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	500 Mcf AF 1,125 psi/48 hrs. development Cherrytree Run pool Tonawanda field	600 Mcf AF 930 psi/48 hrs. development Tecza pool Hamilton Corners field	80 Mcf AF 1,300 psi/72 hrs. development Gresham pool Breedtown field	550 Mcf AF 1,150 psi/48 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,475 psi/48 hrs. development Mt. Carmel pool Oempseytown field	650 Mcf AF 1,350 psi/48 hrs. development Tecza pool Hamilton Corners field	550 Mcf AF 1,345 psi/48 hrs. development Beatty Run pool Cooperstown field	650 Mcf AF 1,225 psi/13 hrs. development Gresham pool Breedtown field	600 Mcf AF 1,500 psi/48 hrs. development Mt. Carmel pool Deepseatown field	550 Mcf AF 1,125 psi/48 hrs. development Beatty Run pool Cooperstown field

Figure 35. (Continued).

COUNTY Permit Number	Venango 121-42498	Venango 121-42499	Venango 121-42500	Venango 121-42501	Venango 121-42504	Venango 121-42505	Venango 121-42506	Venango 121-42507	Venango 121-42509	Venango 121-42513
NAME OF WELL	Moyer Unit #1	Spangler Unit #2	Maria O'Shuraak #1	Hilyer #1	Say Unit #1	Carter Unit #1	Weber-Speer Unit #2	Mildred A. Merry #1-A	Betty C. Root #1	Wendell E. Minnigh #3
OPERATOR	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Dakland	Dakland	Plum	Dakland	Dakland	Dakland	Oakland	Cherrytree	Plum	Plum
QUADRANGLE	Oempseytown	Oempseytown	Oempseytown	Oempseytown	Oempseytown	Oempseytown	Oempseytown	Titusville South	Oempseytown	Sugar Lake
LATITUDE	7,550 ft. S 41°32'30"	4,700 ft. S 41°32'30"	1,870 ft. S 41°37'30"	7,700 ft. S 41°32'30"	11,900 ft. S 41°35'00"	1,150 ft. S 41°32'30"	12,050 ft. S 41°32'30"	11,000 ft. S 41°37'30"	6,520 ft. S 41°37'30"	3,720 ft. S 41°35'00"
LONGITUDE	2,950 ft. W 79°47'30"	10,050 ft. W 79°45'00"	5,400 ft. W 79°45'00"	8,250 ft. W 79°45'00"	7,550 ft. W 79°45'00"	7,300 ft. W 79°45'00"	7,320 ft. W 79°45'00"	6,180 ft. W 79°42'30"	1,120 ft. W 79°47'30"	2,950 ft. W 79°42'30"
DATE COMPLETED	8-17-88	6-7-88	8-4-88	7-8-88	6-20-88	6-27-88	7-19-88	8-11-88	6-30-88	8-18-88
ELEVATION	1440 GR	1278 GR	1590 GR	1366 GR	1288 GR	1481 GR	1422 GR	1502 GR	1422 GR	1527 GR
LOGS RECEIVED AND LOGGED INTERVALS										PCL: 5160-5467
TULLY LIMESTONE	3884-	3626-	3722-	3735-	3580-	3808-	3826-	3754-	3576-	3641-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4030-	3824-	3969-	3984-	3830-	4060-	4072-	4014-	3821-	3862-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4154-	3996-	4114-	4102-	3953-	4180-	4190-	4150-	3971-	4006-
SILURIAN-DEVONIAN CARBONATES	4186-	4030-	4132-	4132-	3984-	4220-	4218-	4169-	3996-	4030-
SALINA GROUP LOCKPORT DOLOMITE	4350- 5018-	4187- 4858-	4432- 4830-	4296- 4974-	4138- 4790-	4368- 5038-	4388- 5078-	4472- 4888-	4286- 4687-	4338- 4786-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5342- 5410-	5176- 5246-	5190- 5257-	5303- 5370-	5064- 5178-	5308- 5426-	5396- 5469-	5250- 5315-	5044- 5112-	5145- 5207-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5516- 5610- 5644-	5357- 5437- 5480-	5314- 5445- 5480-	5469- 5572- 5602-	5276- 5377- 5406-	5525- 5624- 5658-	5587- 5670- 5704-	5375- 5508- 5540-	5170- 5304- 5333-	5262- 5405- 5435-
QUEENSTON FORMATION	5658-	5491-	5489-	5616-	5417-	5666-	5716-	5551-	5344-	5447-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5521-5590	5372-5434	5369	5478-5558	5295-5366	5559-5611	5590-5671	5431-5458	5229-5253	5315-5348
TOTAL DEPTH	5726	5580	5575	5710	5510	5770	5790	5613	5405	5512
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	80 Mcf AF 1,290 psi/72 hrs. development Beatty Run pool Cooperstown field	143 Mcf AF 1,480 psi/72 hrs. development Beatty Run pool Cooperstown field	650 Mcf AF 1,475 psi/48 hrs. development Gresham pool Breedtown field	80 Mcf AF 1,410 psi/72 hrs. development Mt. Carmel pool Oempseytown field	127 Mcf AF 1,475 psi/72 hrs. development Tezca pool Hamilton Corners field	250 Mcf AF 1,465 psi/72 hrs. development Tezca pool Hamilton Corners field	126 Mcf AF 1,425 psi/72 hrs. development Mt. Carmel pool Oempseytown field	650 Mcf AF 1,125 psi/48 hrs. development Gresham pool Breedtown field	600 Mcf AF 1,425 psi/48 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,250 psi/48 hrs. development Wilson Mills pool Lake Creek field

COUNTY Permit Number	Venango 121-42515	Venango 121-42516	Venango 121-42517	Venango 121-42520	Venango 121-42521	Venango 121-42522	Venango 121-42523	Venango 121-42524	Venango 121-42527	Venango 121-42529
NAME OF WELL	Roger S. Ray #1	Mavro Corp. #3	Burdick #1	R. A. Pape #1	Theodore Ryznar #4	Howard Oltman #1	Ames Unit #1	Call #1	Behr #1	August Unit #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation
TOWNSHIP	Plum	Oakland	Plum	Jackson	Plum	Oakland	Oakland	Plum	Plum	Plum
QUADRANGLE	Oempseytown	Titusville South	Dempseytown	Sugar Lake	Dempseytown	Oempseytown	Oempseytown	Dempseytown	Oempseytown	Oempseytown
LATITUDE	6,800 ft. S 41°35'00"	9,050 ft. S 41°32'30"	3,600 ft. S 41°37'30"	6,550 ft. S 41°32'30"	3,630 ft. S 41°37'30"	14,030 ft. S 41°32'30"	1,400 ft. S 41°35'00"	4,400 ft. S 41°37'30"	14,950 ft. S 41°37'30"	950 ft. S 41°35'00"
LONGITUDE	9,000 ft. W 79°05'00"	2,520 ft. W 79°42'30"	1,000 ft. W 79°47'30"	3,950 ft. W 79°52'30"	9,960 ft. W 79°45'00"	5,510 ft. W 79°05'00"	5,150 ft. W 79°45'00"	9,200 ft. W 79°45'00"	850 ft. W 79°50'00"	2,250 ft. W 79°50'00"
DATE COMPLETED	7-12-88	7-26-88	7-26-88	7-11-88	8-18-88	8-11-88	8-9-88	8-11-88	8-2-88	8-16-88
ELEVATION	1271 GR	1515 GR	1422 GR	1326 GR	1500 GR	1540 GR	1484 GR	1523 GR	1503 GR	1504 GR
LOGS RECEIVED AND LOGGED INTERVALS		GR/PCL: 5200-5446								
TULLY LIMESTONE	3558-	3974-	3346-		3626-	3961-	3812-	3654-	3658-	3648-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3810-	4238-	3790-		3870-	4221-	4062-	3900-	3892-	3879-
ORISKANY SANDSTONE RIUGELEY SANDSTONE	3943-	4352-	3944-		4026-	4337-	4188-	4053-	4030-	4016-
SILURIAN-DEVONIAN CARBONATES	3970-	4376-	3970-		4050-	4356-	4220-	4078-	4058-	4042-
SALINA GROUP LOCKPORT DOLOMITE	4275- 4695-	4715- 5212-	4088- 4632-		4340- 4732-	4700- 5190-	4372- 5032-	4198- 4812-	4194- 4812-	4182- 4812-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5052- 5120-	5588- 5638-	5012- 5076-		5100- 5175-	5563- 5620-	5352- 5420-	5134- 5196-	5140- 5202-	5128- 5196-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5180- 5316- 5348-	5704- 5830- 5872-	5162- 5268- 5300-	5228- 5336- 5386-	5222- 5350- 5386-	5687- 5824- 5854-	5530- 5625- 5652-	5394- 5427-	5296- 5327- 5426-	5286- 5344- 5386-
QUEENSTON FORMATION	5360-	5882-	5312-	5412-	5396-	5866-	5664-	5436-	5438-	5434-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5241-5260	5751-5782	5177-5261	5264-5333	5261-5325	5765-5822	5537-5596	5321-5370	5299-5359	5303-5336
TOTAL DEPTH	5425	5972	5405	5506	5490	5937	5716	5482	5530	5514
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	600 Mcf AF 1,390 psi/48 hrs. development Beatty Run pool Cooperstown field	600 Mcf AF 1,410 psi/48 hrs. development Splane Diamond pool Oakland field	230 Mcf AF 1,200 psi/72 hrs. development Diamond pool roy field	50 Mcf AF 1,405 psi/72 hrs. development Beatty Run pool Cooperstown field	650 Mcf AF 1,150 psi/48 hrs. development Gresham pool Breedtown field	IP not reported 1,380 psi/48 hrs. development Mt. Carmel pool Oempseytown field	170 Mcf AF 1,405 psi/72 hrs. development Teeza pool Hamilton Corners field	80 Mcf AF 1,400 psi/72 hrs. development Gresham pool Breedtown field	195 Mcf AF 1,075 psi/72 hrs. development Beatty Run pool Cooperstown field	315 Mcf AF 1,350 psi/72 hrs. development Beatty Run pool Cooperstown field

Figure 35. (Continued).

COUNTY Permit Number	Venango 121-42535	Venango 121-42536	Venango 121-42537	Venango 121-42539	Venango 121-42541	Venango 121-42542	Venango 121-42546	Venango 121-42549	Venango 121-42550	Venango 121-42552
NAME OF WELL	Michael Shevchik #1	R. Smith #1	Edwin S. Snyder #1	Cannon Unit #1	Emick Unit #1	Deets Unit #2	Elizabeth J. Ellen #2	Wolaki #1	Quick #1N	Stevenson #1
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation
TOWNSHIP	Plum	Canal	Jackson	Plum	Dakland	Dakland	Cherrytree	Plum	Plum	Plum
QUADRANGLE	Oempseytown	Utica	Oempseytown	Oempseytown	Oempseytown	Oempseytown	Titusville South	Oempseytown	Oempseytown	Oempseytown
LATITUDE	590 ft. S 41°35'00"	11,000 ft. S 41°30'00"	14,130 ft. S 41°35'00"	9,450 ft. S 41°35'00"	11,500 ft. S 41°32'30"	2,300 ft. S 41°32'30"	3,800 ft. S 41°35'00"	9,100 ft. S 41°37'30"	11,000 ft. S 41°37'30"	6,200 ft. S 41°37'30"
LONGITUDE	11,275 ft. W 79°45'00"	7,650 ft. W 79°57'00"	7,540 ft. W 79°50'00"	6,500 ft. W 79°50'00"	5,250 ft. W 79°45'00"	3,150 ft. W 79°45'00"	10,600 ft. W 79°40'00"	10,600 ft. W 79°45'00"	7,400 ft. W 79°45'00"	8,700 ft. W 79°45'00"
DATE COMPLETED	9-21-88	9-23-88	9-28-88	9-30-88	9-7-88	8-25-88	9-1-88	9-14-88	8-30-88	9-15-88
ELEVATION	1482 GR	1100 GR	1325 GR	1289 GR	1561 GR	1412 GR	1543 GR	1469 GR	1478 GR	1540 GR
LOGS RECEIVED AND LOGGED INTERVALS										
TULLY LIMESTONE	3724-	3375-	3570-	3498-	3960-	3778-	3874-	3650-	3690-	3698-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3972-	3593-	3803-	3728-	4210-	4030-	4134-	3894-	3940-	3948-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4112-	3734-	3935-	3866-	4326-	4150-	4256-	4038-	4080-	4102-
SILURIAN-DEVONIAN CARBONATES	4131-	3767-	3967-	3894-	4354-	4180-	4274-	4070-	4132-	4132-
SALINA GROUP LOCKPORT DOLOMITE	4441- 4832-	4090- 4520-	4280- 4730-	4038- 4672-	4526- 5212-	4340- 5008-	4595- 5047-	4197- 4788-	4242- 4836-	4256- 4846-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5190- 5260-	4933- 5000-	5078- 5142-	4898- 5061-	5534- 5604-	5326- 5398-	5406- 5478-	5109- 5176-	5152- 5220-	5166- 5231-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5319- 5450- 5483-	5560- 5210- 5239-	5202- 5338- 5370-	5158- 5201- 5284-	5700- 5759- 5835-	5195- 5218- 5829-	5540- 5277- 5700-	5368- 5278- 5400-	5316- 5375- 5444-	5320- 5366- 5456-
QUEENSTON FORMATION	5494-	5250-	5384-	5298-	5852-	5640-	5718-	5412-	5458-	5468-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5382-5406	5119-5136	5254-5285	5161-5232	5720-5778	5502-5569	5581-5621	5283-5358	5297-5382	5345-5416
TOTAL DEPTH	5553	5325	5440	5390	5930	5720	5778	5510	5540	5500
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	450 Mcf AF 1,410 psi/48 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,000 psi/48 hrs. development Beatty Run pool McDune Run field	450 Mcf AF 1,125 psi/48 hrs. development Beatty Run pool Cooperstown field	113 Mcf AF 1,425 psi/72 hrs. development Beatty Run pool Cooperstown field	165 Mcf AF 1,380 psi/72 hrs. development Mt. Carmel pool Oempseytown field	90 Mcf AF 1,350 psi/72 hrs. development Teca pool Hamilton Corners field	450 Mcf AF 1,150 psi/48 hrs. development Cherrytree Run pool Toonerville field	80 Mcf AF 1,200 psi/72 hrs. development Gresham pool Breedtown field	55 Mcf AF 1,335 psi/72 hrs. development Gresham pool Breedtown field	500 Mcf AF 1,400 psi/72 hrs. development Gresham pool Breedtown field

COUNTY Permit Number	Venango 121-42554	Venango 121-42555	Venango 121-42556	Venango 121-42559	Venango 121-42560	Venango 121-42561	Venango 121-42563	Venango 121-42566	Venango 121-42569	Venango 121-42571
NAME OF WELL	Kohl #12	Woods #2	Matthews-Wagner Unit #2	Pitt #2	Helen C. Columbus #1	Hazel Cook #2	James L. Beck #1	Rampley #1	Joseph J. Madden #2	Hefferman #1
OPERATOR	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation	Cabot Oil & Gas Corporation	Mark Resources Corporation
TOWNSHIP	Plum	Plum	Plum	Plum	Plum	Plum	Allegheny	Plum	Plum	Plum
QUADRANGLE	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Dempseytown	Pleasantville	Dempseytown	Dempseytown	Dempseytown
LATITUDE	12,250 ft. S 41°35'00"	11,950 ft. S 41°35'00"	11,250 ft. S 41°35'00"	2,900 ft. S 41°35'00"	10,220 ft. S 41°35'00"	2,300 ft. S 41°35'00"	10,130 ft. S 41°35'00"	15,120 ft. S 41°35'00"	5,150 ft. S 41°35'00"	12,600 ft. S 41°35'00"
LONGITUDE	9,650 ft. W 79°47'30"	7,800 ft. W 79°47'30"	1,750 ft. W 79°50'00"	9,450 ft. W 79°50'00"	1,270 ft. W 79°50'00"	7,050 ft. W 79°45'00"	1,720 ft. W 79°32'30"	3,800 ft. W 79°50'00"	11,250 ft. W 79°50'00"	9,250 ft. W 79°50'00"
DATE COMPLETED	10-19-88	9-29-88	9-21-88	9-22-88	10-25-88	10-7-88	10-15-88	10-7-88	10-5-88	11-8-88
ELEVATION	1497 GR	1470 GR	1391 GR	1262 GR	1370 GR	1378 GR	1577 GR	1471 GR	1380 GR	1213 GR
LOGS RECEIVED AND LOGGED INTERVALS										
TULLY LIMESTONE	3750-	3730-	3617-	3617-	3602-	3629-	4095-	3608-	3521-	3430-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3986-	3972-	3850-	3850-	3835-	3882-	4371-	3838-	3744-	3660-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4120-	4100-	3982-	3982-	3970-	4018-	4446-	3976-	3890-	3796-
SILURIAN-DEVONIAN CARBONATES	4156-	4132-	4014-	4014-	4000-	4048-	4460-	4006-	3914-	3826-
SALINA GROUP LOCKPORT DOLOMITE	4282- 4942-	4280- 4920-	4148- 4786-	4148- 4786-	4310- 4731-	4238- 4760-	4816- 5322-	4144- 4766-	4221- 4664-	3968- 4614-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5264- 5328-	5244- 5311-	5114- 5174-	5114- 5174-	5091- 5104-	5110- 5177-	5706- 5776-	5080- 5154-	5023- 5086-	4936- 4997-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5438- 5479- 5552-	5421- 5453- 5538-	5288- 5332- 5398-	5288- 5332- 5398-	5216- 5344- 5379-	5230- 5372- 5401-	5836- 5990- 6009-	5274- 5308- 5375-	5144- 5288- 5312-	5090- 5152- 5227-
QUEENSTON FORMATION	5566-	5550-	5412-	5412-	5391-	5412-	6018-	5388-	5326-	5242-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5444-5504	5418-5484	5296-5347	5053-5101	5256-5302	5281-5302	5907-5942	5255-5318	5213-5232	5102-5190
TOTAL DEPTH	5628	5612	5512	5512	5452	5475	6080	5482	5386	5311
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	97 Mcf. AF 1,450 psi/72 hrs. development Beatty Run pool Cooperstown field	153 Mcf. AF 1,470 psi/72 hrs. development Beatty Run pool Cooperstown field	50 Mcf. AF 1,425 psi/72 hrs. development Beatty Run pool Cooperstown field	283 Mcf. AF 1,485 psi/72 hrs. development Beatty Run pool Lake Creek field	500 Mcf. AF 950 psi/48 hrs. development Beatty Run pool Cooperstown field	500 Mcf. AF 770 psi/48 hrs. development Beatty Run pool Cooperstown field	500 Mcf. AF 790 psi/48 hrs. extension Beatty Run pool Pleasantville field	120 Mcf. AF 1,425 psi/72 hrs. development Beatty Run pool Cooperstown field	600 Mcf. AF 1,300 psi/48 hrs. development Beatty Run pool Lake Creek field	350 Mcf. AF 1,485 psi/72 hrs. development Beatty Run pool Cooperstown field

Figure 35. (Continued).

COUNTY	Permit Number	Venango 121-42572	Venango 121-42578	Venango 121-42579	Venango 121-42580	Venango 121-42581	Venango 121-42586	Venango 121-42587	Venango 121-42590	Venango 121-42594	Venango 121-42601
NAME OF WELL	Robert C. Lowers #3	Raymond Armstrong #4	Raymond Armstrong #5	Merle Longberry #1	Floyd N. Frankie #1	William R. Herb #1	Glenn P. Clinger #2	Kraft Concrete Products, Inc. #1	Martha L. Brown #1-A	Cabot Oil & Gas Corporation	Kraft Concrete Products, Inc. #2-A
OPERATOR	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation	Cabot Oil & Gas Corporation
TOWNSHIP	Cherrytree	Jackson	Jackson	Canal	Plum	Plum	Oakland	Jackson	Cherrytree	Jackson	Jackson
QUADRANGLE	Titusville South	Sugar Lake	Sugar Lake	Sugar Lake	Dempseytown	Dempseytown	Dempseytown	Sugar Lake	Titusville South	Sugar Lake	Sugar Lake
LATITUDE	5,400 ft. S 41°35'00"	3,740 ft. S 41°32'30"	5,300 ft. S 41°32'30"	12,710 ft. S 41°32'30"	14,450 ft. S 41°31'30"	3,500 ft. S 41°37'30"	11,300 ft. S 41°32'30"	11,000 ft. S 41°32'30"	7,620 ft. S 41°37'30"	12,800 ft. S 41°32'30"	12,800 ft. S 41°32'30"
LONGITUDE	8,100 ft. W 79°42'30"	1,980 ft. W 79°52'30"	350 ft. W 79°52'30"	4,610 ft. W 79°57'30"	9,420 ft. W 79°45'00"	4,030 ft. W 79°47'30"	6,500 ft. W 79°47'30"	3,500 ft. W 79°52'30"	3,360 ft. W 79°42'30"	3,420 ft. W 79°52'30"	3,420 ft. W 79°52'30"
DATE COMPLETED	10-5-88	10-29-88	10-7-88	10-19-88	10-13-88	10-13-88	10-26-88	11-3-88	11-3-88	11-18-88	11-18-88
ELEVATION	1500 GR	1345 GR	1420 GR	1419 GR	1450 GR	1510 GR	1250 GR	1305 GR	1567 GR	1295 GR	1295 GR
LOGS RECEIVED AND LOGGED INTERVALS											
TULLY LIMESTONE	3819-	3600-	3676-	3576-	3690-	3610-	3602-	3584-	3814-	3605-	3605-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4076-	3826-	3903-	3802-	3939-	3846-	3843-	3811-	4075-	3832-	3832-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4202-	3962-	4035-	3944-	4076-	4000-	3968-	3946-	4208-	3962-	3962-
SILURIAN-DEVONIAN CARBONATES	4224-	3990-	4058-	3983-	4096-	4025-	3998-	3977-	4237-	3987-	3987-
SALINA GROUP LOCKPORT DOLOMITE	4544- 4982-	4300- 4766-	4378- 4836-	4204- 4768-	4410- 4802-	4322- 4725-	4322- 4852-	4297- 4760-	4540- 4941-	4318- 4786-	4318- 4786-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5344- 5412-	5120- 5182-	5194- 5258-	5132- 5196-	5157- 5228-	5080- 5145-	5153- 5222-	5118- 5184-	5298- 5368-	5148- 5209-	5148- 5209-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5474- 5602- 5640-	5250- 5384- 5416-	5319- 5455- 5490-	5255- 5395- 5430-	5287- 5424- 5449-	5200- 5326- 5363-	5288- 5421- 5456-	5248- 5330- 5416-	5431- 5561- 5590-	5221- 5403- 5442-	5221- 5403- 5442-
QUEENSTON FORMATION	5652-	5429-	5501-	5440-	5460-	5376-	5466-	5438-	5600-	5458-	5458-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5533-5551	5301-5322	5370-5404	5306-5347	5346-5362	5251-5272	5336-5395	5295-5328	5469-5510	5323-5358	5323-5358
TOTAL DEPTH	5723	5490	5570	5500	5512	5435	5533	5462	5655	5550	5550
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	400 Mcf AF 1,410 psi/48 hrs. development Iezza pool Hamilton Corners field	500 Mcf AF 1,200 psi/48 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,010 psi/48 hrs. development Beatty Run pool Cooperstown field	500 Mcf AF 1,120 psi/48 hrs. development Canal pool McCurry Run field	500 Mcf AF 1,000 psi/48 hrs. development Beatty Run pool Cooperstown field	450 Mcf AF 1,150 psi/48 hrs. development Diamond pool Troy field	550 Mcf AF 700 psi/48 hrs. development Beatty Run pool Cooperstown field	550 Mcf AF 1,360 psi/48 hrs. development Beatty Run pool Cooperstown field	450 Mcf AF 1,450 psi/48 hrs. development Graham pool Breedtown field	500 Mcf AF 1,220 psi/48 hrs. development Beatty Run pool Cooperstown field	500 Mcf AF 1,220 psi/48 hrs. development Beatty Run pool Cooperstown field

COUNTY Permit Number	Warren 123-28446	Warren 123-28447	Warren 123-35463	Warren 123-36140	Warren 123-36159	Warren 123-37822	Warren 123-39390	Warren 123-39608	Warren 123-39644	Warren 123-39645
NAME OF WELL	William 8. Eddy #1	William 8. Eddy #2	Halliday #1	Leslie J. Oodd #3	Wasack-Oodd #1	Meivin Bacous #2	Miller #1	M. Seketak #4	Seigworth #1-C	Seigworth #1-A
OPERATOR	Toral Resources, Inc.	Toral Resources, Inc.	U. S. Energy Development Corp.	Pine Valley Resources, Inc.	Pine Valley Resources, Inc.	N.E.A. Cross Company	M.A.T. Oil & Gas Exploration, Inc.	Universal Resource Holdings, Inc.	Ooran & Associates, Inc. #RP-129	Ooran & Associates, Inc. #RP-113
TOWNSHIP	Freehold	Freehold	Freehold	Columbus	Columbus	Columbus	Southwest	Columbus	Southwest	Southwest
QUADRANGLE	Lottsville	Lottsville	Columbus	Columbus	Columbus	Columbus	Grand Valley	Lottsville	Grand Valley	Grand Valley
LATITUDE	6,200 ft. S 42°00'00"	7,600 ft. S 42°00'00"	9,300 ft. S 42°00'00"	10,350 ft. S 41°57'30"	4,890 ft. S 41°57'30"	9,600 ft. S 41°57'30"	4,700 ft. S 41°42'30"	8,275 ft. S 41°55'00"	520 ft. S 41°40'00"	180 ft. S 41°40'00"
LONGITUDE	7,100 ft. W 79°27'30"	10,200 ft. W 79°27'30"	3,100 ft. W 79°30'00"	4,100 ft. W 79°35'00"	9,250 ft. W 79°32'30"	8,700 ft. W 79°30'00"	8,500 ft. W 79°30'00"	10,835 ft. W 79°27'30"	9,210 ft. W 79°32'30"	970 ft. W 79°35'00"
DATE COMPLETED	12-10-88	12-9-88	8-22-84	1-31-85	1-23-85	8-20-85	4-15-87	8-4-87	7-10-87	7-2-87
ELEVATION	1750 GR	1735 GR	1588 GR	1452 GR	1452 GR	1570 GR	1655 GR	1575 GR	1634 GR	1382 GR
LOGS RECEIVED AND LOGGED INTERVALS			COL: 2850-4574 OLL: 2850-4574		COL/CNL: 2699-4479	COL: 2700-4690		COL/CNL: 0-5720 OLL: 0-5720 INT: 0-5720		COL/CNL/GR: 0-5482 OLL: 730-5500 INT: 3780-5400
TULLY LIMESTONE	3060-	3006-	2864-	2756-	2776-	2950-	3877-	3108-	3864-	3604-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3366-	3302-	3160-	3032-	3050-	3238-	4164-	3398-	4150-	3882-
ORISKANY SANDSTONE RIDGELEY SANDSTONE				3206-			4264-		4268-	4000-
SILURIAN-DEVONIAN CARBONATES	3530-	3458-	3348-	3221-	3225-	3426-	4283-		4289-	4018-
SALINA GROUP LOCKPORT DOLOMITE	3735- 4035-	3835- 4030-	3392- 3956-	3266- 3922-	3292- 3958-	3468- 4042-	4412- 5006-	3920-	4375- 5130-	4094- 4864-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4514-	4456-	4224- 4282-	4097- 4172-	4133- 4196-	4330- 4375-	5242- 5374-	4552-	5335- 5406-	5075- 5142-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	4544- 4667- 4696-	4513- 4589- 4640-	4320- 4454- 4486-	4220- 4322- 4372-	4218- 4366- 4398-	4412- 4550- 4582-	5419- 5555- 5596-	4600- 4730- 4770-	5456- 5601-	5189- 5328- 5362-
QUEENSTON FORMATION	4717-	4656-	4498-	4386-	4409-	4594-	5610-	4788-	5636-	5368-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4547-4713	4520-4643	4381-4489	4291-4359	4268-4388	4479-4523	5481-5608	4644-4727	5506-5639	5201-5335
TOTAL DEPTH	4781	4773	4602	4483	4492	4715	5753	4914	5725	5541
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,250 Mcf AF development Owey Corners pool Columbus field	760 Mcf AF development Owey Corners pool Columbus field	2,635 Mcf AF development Owey Corners pool Columbus field	2,100 Mcf AF development Hare Creek pool Columbus field	4,500 Mcf AF development Owey Corners pool Columbus field	800 Mcf AF development Whites Run pool Columbus field	2,300 Mcf AF development Campbell Creek pool Goodwill Hill-Grand Valley field	1,150 Mcf AF development Campbell Creek pool Goodwill Hill-Grand Valley field	460 Mcf AF development Campbell Creek pool Goodwill Hill-Grand Valley field	350 Mcf AF development Campbell Creek pool Goodwill Hill-Grand Valley field

Figure 35. (Continued).

COUNTY Permit Number	Warren 123-39646	Warren 123-39648	Warren 123-39649	Warren 123-39652	Warren 123-39659	Warren 123-39668	Warren 123-39673	Warren 123-39674	Warren 123-39678	Warren 123-39697
NAME OF WELL	Seigworth #2-A	Deron Taylor #1	Schwab Erickson #2	Dngley #1	Cochran Van Guilder #1	W. Kightlinger #1-A	W. Kightlinger #1-B	Seigworth #2-A	M. Vanduller #1	A. Kuzma Estate #1
OPERATOR	Doran & Associates, Inc. #KP-115	Universal Resource Holdings, Inc.	Quaker State Oil Refining Corporation	Doran & Associates, Inc. #KP-114	Quaker State Oil Refining Corporation	Doran & Associates, Inc. #KP-157	Doran & Associates, Inc. #KP-128	Doran & Associates, Inc. #KP-116	Doran & Associates, Inc. #KP-088	Eastern States Energy, Inc.
TOWNSHIP	Southwest	Spring Creek	Southwest	Eldred	Southwest	Eldred	Eldred	Southwest	Eldred	Columbus
QUADRANGLE	Grand Valley	Lottsville	Grand Valley	Spring Creek	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Columbus
LATITUDE	14,290 ft. S 41°42'30"	4,625 ft. S 41°55'00"	7,520 ft. S 41°40'00"	10,850 ft. S 41°47'30"	4,650 ft. S 41°40'00"	2,600 ft. S 41°45'00"	4,570 ft. S 41°45'00"	8,680 ft. S 41°42'30"	3,325 ft. S 41°45'00"	10,250 ft. S 41°57'30"
LONGITUDE	3,090 ft. W 79°35'00"	7,950 ft. W 79°27'30"	10,200 ft. W 79°32'30"	3,530 ft. W 79°35'00"	6,250 ft. W 79°35'00"	4,390 ft. W 79°32'30"	3,370 ft. W 79°32'30"	9,090 ft. W 79°32'30"	7,500 ft. W 79°30'00"	2,600 ft. W 79°32'30"
DATE COMPLETED	2-20-87	1-22-88	3-18-87	10-17-87	12-2-87	9-21-87	9-3-87	7-8-87	8-25-87	3-6-87
ELEVATION	1270 GR	1763 GR	1600 GR	1698 GR	1280 GR	1510 GR	1633 GR	1586 GR	1403 GR	1565 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL/CNL/GR: 0-5348 DIL: 3249-5002 INT: 3244-4988	CDL/CNL: 950-5462 DIL: 950-5450 INT: 5120-5307				CDL/CNL/GR: 0-5320	CDL/CNL/GR: 0-5488	CDL/CNL: 0-5322 DIL/GR: 0-5322 INT: 0-5281	CDL/CNL/GR: 0-5281 DIL: 106-5289 INT: 0-5281	CDL/CNL: 0-4690 DIL: 519-4716
TULLY LIMESTONE	3483-	3305-	3906-	3612-	3528-	3579-	3654-	3462-	3450-	2958-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3764-	3588-	4184-	3878-	3805-	3802-	3928-	3737-	3727-	3240-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3888-		4308-		3927-			3854-		
SILURIAN-DEVONIAN CARBONATES	3906-	3790-		4015-	3948-	3935-	4057-	3878-	3867-	3400-
SALINA GROUP LOCKPORT DOLOMITE	3990- 4750-	3804- 4506-	4453- 5091-	4078- 4830-	4070- 4708-	3992- 4756-	4118- 4892-	3948-	3927- 4702-	3470- 4120-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4960- 5001-	4692- 4740-	5328- 5446-	5036- 5084-	4928- 5068-	4920- 4997-	5092- 5137-	4904- 4969-	4895- 4938-	4316- 4371-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5048- 5190- 5220-	4762- 4908- 4951-	5497- 5630- 5674-	5124- 5251- 5296-	5116- 5251- 5288-	5045- 5194- 5216-	5130- 5330- 5358-	5012- 5160- 5192-	4982- 5121- 5160-	4408- 4550- 4576-
QUEENSTON FORMATION	5228-	4964-	5682-	5304-	5296-	5228-	5367-	5200-	5166-	4586-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5056-5224	4830-4958	5549-5680	5176-5299	5164-5294	5114-5224	5238-5363	5085-5193	5034-5163	4452-4579
TOTAL DEPTH	5408	5065	5779	5466	5446	5354	5531	5355	5360	4725
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	2,300 Mcf AF 1,365 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,813 Mcf AF 1,240 psi/48 hrs. development Whites Run pool Columbus field	1,050 Mcf AF 1,220 psi/96 hrs. development Kirvan pool Enterprise field	867 Mcf AF 1,350 psi/72 hrs. development Three Bridge pool Salkirk field	1,300 Mcf AF 1,150 psi/144 hrs. development Kirvan pool Enterprise field	773 Mcf AF 1,340 psi/72 hrs. development Irrim pool Sanford field	773 Mcf AF 1,350 psi/72 hrs. development Irrim pool Sanford field	1,425 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,319 Mcf AF 1,425 psi/72 hrs. development Irrim pool Sanford field	900 Mcf AF 1,080 psi/24 hrs. development Whites Run pool Columbus field

COUNTY Permit Number	Warren 123-39712	Warren 123-39722	Warren 123-39723	Warren 123-39734	Warren 123-39739	Warren 123-39747	Warren 123-39748	Warren 123-39784	Warren 123-39785	Warren 123-39786
NAME OF WELL	Daelhousen #1	M. Johnson #1	Bush #1	Milton Johnson #1-A	Arthur Burleigh #18	Shank Heirs #2	Brown #1	Bush #2	Hammemill #4	J. Thomas #1
OPERATOR	M.A.T. Dill & Gas Exploration, Inc.	M.A.T. Dill & Gas Exploration, Inc.	M.A.T. Dill & Gas Exploration, Inc.	Ooran & Associates, Inc. #KP-144	Ooran & Associates, Inc. #KP-133	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Dill & Gas Exploration, Inc.	M.A.T. Dill & Gas Exploration, Inc.	Ooran & Associates, Inc. #KP-134	Oouglas Oil & Gas, Inc.
TOWNSHIP	Southwest	Eldred	Eldred	Eldred	Eldred	Southwest	Eldred	Eldred	Southwest	Spring Creek
QUADRANGLE	Grand Valley	Spring Creek	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Spring Creek
LATITUDE	10,200 ft. S 41°40'00"	11,900 ft. S 41°47'30"	800 ft. S 41°42'30"	7,500 ft. S 41°45'00"	10,175 ft. S 41°45'00"	8,000 ft. S 41°40'00"	1,800 ft. S 41°45'00"	800 ft. S 41°42'30"	11,920 ft. S 41°42'30"	10,800 ft. S 41°50'00"
LONGITUDE	8,200 ft. W 79°32'30"	1,400 ft. W 79°32'30"	2,700 ft. W 79°35'00"	640 ft. W 79°32'30"	5,920 ft. W 79°35'00"	7,200 ft. W 79°32'30"	6,100 ft. W 79°35'00"	3,850 ft. W 79°35'00"	4,090 ft. W 79°35'00"	1,260 ft. W 79°35'00"
DATE COMPLETED	6-23-87	6-2-87	5-4-87	8-31-87	7-9-87	6-16-87	11-19-88	6-30-87	9-23-87	8-21-87
ELEVATION	1470 GR	1655 GR	1670 GR	1421 GR	1630 GR	1480 GR	1382 GR	1685 GR	1295 GR	1550 GR
LOGS RECEIVED AND LOGGED INTERVALS				COL/GR: 0-5320	COL/GR: 3650-5453				COL/GR: 3150-5345	COL/CNL: 3250-5109
TULLY LIMESTONE	3810-	3625-	3763-	3505-	3666-	3804-	3437-	3786-	3449-	3325-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4092-	3898-	4038-	3784-	3932-	4090-	3724-	4058-	3726-	3589-
ORISKANY SANDSTONE RIODELO SANDSTONE	4206-					4197-	3820- Bols Bianco	4192-	3851-	
SILURIAN-DEVONIAN CARBONATES	4227-	4030-		3901-	4076-	4221-	3850-	4202-	3866-	3734-
SALINA GROUP LOCKPORT DOLOMITE	4363- 5005-	4132- 4724-		3968- 4756-	4138- 4904-	4357- 4990-	3955- 4575-	4310- 4927-	3955- 4734-	3800- 3558-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5241- 5363-	4949- 5086-	5253-	4921- 4990-	5090- 5152-	5212- 5350-	4794- 4926-	5154- 5284-	4915- 4881-	4714- 4782-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	5415- 5273- 5594-	5133- 5273- 5302-	5318-	5034- 5182- 5212-	5198- 5324- 5370-	5401- 5543- 5579-	4970- 5114- 5144-	5333- 5453- 5500-	5028- 5168- 5202-	4804- 4956- 4988-
QUEENSTON FORMATION	5601-	5313-		5220-	5376-	5586-	5156-	5510-	5210-	5000-
PRODUCING FORMATION	Medina	Medina		Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5432-5600	5182-5310		5103-5216	5261-5375	5455-5585	5023-5154	5346-5508	5096-5207	4870-4998
TOTAL DEPTH	5715	5445	5318	5354	5506	5675	5264	5628	5362	5109
DEEPEST FORMATION REACHED	Queenston	Queenston	Medina	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	3,900 Mcf AF 1,200 psi/48 hrs. development Kirvan pool Enterprise field	1,000 Mcf AF 1,100 psi/72 hrs. development Triam pool Sanford field	Junked and abandoned Three Bridge pool Selkirk field	583 Mcf AF 1,325 psi/72 hrs. development Triam pool Sanford field	680 Mcf AF 1,260 psi/72 hrs. development Three Bridge pool Selkirk field	1,300 Mcf AF 1,200 psi/48 hrs. development Kirvan pool Enterprise field	1,000 Mcf AF 1,340 psi/240 hrs. development Triam pool Sanford field	2,500 Mcf AF 1,200 psi/96 hrs. development Three Bridge pool Selkirk field	1,350 Mcf AF 1,460 psi/72 hrs. development Porky Run pool Dotyville field	1,100 Mcf AF 1,310 psi/168 hrs. development County Line field

Figure 35. (Continued).

COUNTY Permit Number	Warren 123-39787	Warren 123-39788	Warren 123-39789	Warren 123-39798	Warren 123-39799	Warren 123-39821	Warren 123-39822	Warren 123-39823	Warren 123-39825	Warren 123-39826
NAME OF WELL	Cubbon Lumber Co. #2	Cubbon Lumber Co. #1	Hammermill #2	V. Nichols #2	V. Nichols #1	Hammermill #3	McGraw #3	McGraw #6	McGraw #4	Cochran Caldwell #2
OPERATOR	Douglas Oil & Gas, Incorporated	Douglas Oil & Gas, Incorporated	Doran & Associates, Inc. #KP-199	Oouglas Oil & Gas, Incorporated	Oouglas Oil & Gas, Incorporated	Doran & Associates, Inc. #KP-196	Douglas Oil & Gas, Incorporated	Douglas Oil & Gas, Incorporated	Douglas Oil & Gas, Incorporated	Quaker State Corporation
TOWNSHIP	Southwest	Southwest	Southwest	Spring Creek	Spring Creek	Southwest	Eldred	Eldred	Eldred	Eldred
QUADRANGLE	Grand Valley	Grand Valley	Grand Valley	Spring Creek	Spring Creek	Grand Valley	Spring Creek	Spring Creek	Spring Creek	Grand Valley
LATITUDE	4,300 ft. S 41°40'00"	2,450 ft. S 41°40'00"	8,800 ft. S 41°42'30"	13,950 ft. S 41°50'00"	11,400 ft. S 41°50'00"	10,030 ft. S 41°42'30"	9,200 ft. S 41°47'30"	9,950 ft. S 41°47'30"	10,600 ft. S 41°47'30"	10,950 ft. S 41°45'00"
LONGITUDE	825 ft. W 79°32'30"	825 ft. W 79°32'30"	2,480 ft. W 79°35'00"	3,650 ft. W 79°35'00"	3,600 ft. W 79°35'00"	3,920 ft. W 79°35'00"	6,600 ft. W 79°32'30"	4,650 ft. W 79°32'30"	9,850 ft. W 79°32'30"	7,300 ft. W 79°32'30"
DATE COMPLETED	9-16-87	9-10-87	3-22-88	10-8-87	9-1-87	3-8-88	9-3-87	10-19-87	10-2-87	10-27-87
ELEVATION	1525 GR	1600 GR	1410 GR	1650 GR	1662 GR	1408 GR	1625 GR	1637 GR	1714 GR	1330 GR
LOGS RECEIVED AND LOGGED INTERVALS	PCL: 4750-5681	COL/CNL: 0-5799	GR/COL: 0-5440	COL/CNL: 3400-5214 PCL: 4850-5167	COL/CNL: 3390-5198 DLL: 3391-5185 INI: 4910-5040	GR/COL: 3600-5523	OLL: 3500-5362	COL/CNL: 3550-5381	PCL: 5050-5401	
TULLY LIMESTONE	3843-	3904-	3562-	3436-	3404-	3628-	3556-	3584-	3654-	3475-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4128-	4188-	3838-	3699-	3663-	3904-	3826-	3850-	3922-	3747-
ORISKANY SANDSTONE RIOGLEY SANDSTONE	4236-	4294-	3958-			4026-			4034- Bols Blanc	
SILURIAN-DEVONIAN CARBONATES	4261-	4326-	3972-	3848-	3808-	4040-	3972-	4000-	4057-	3885-
SALINA GROUP LOCKPORT DOLOMITE	4316- 4350-	4402- 5082-	4050- 4742-	3920- 4604-	3878- 4636-	4120- 4800-	4018- 4764-	4044- 4712-	4118- 4728-	3991- 4609-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5308- 5380-	5374- 5442-	5020- 5086-	4832- 4894-	4816- 4860-	5088- 5154-	4976- 5028-	4994- 5054-	5052- 5116-	4826- 4960-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5432- 5566- 5608-	5498- 5648- 5668-	5132- 5265- 5304-	4904- 5068- 5103-	4870- 5032- 5067-	5198- 5319- 5372-	5108- 5210- 5244-	5100- 5238- 5268-	5162- 5304- 5330-	5005- 5140- 5179-
QUEENSTON FORMATION	5620-	5680-	5314-	5108-	5076-	5382-	5254-	5280-	5345-	5190-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5491-5614	5568-5677	5194-5311	4983-5109	4944-5075	5257-5379	5124-5252	5149-5277	5222-5341	5063-5187
TOTAL DEPTH	5726	5790	5456	5214	5212	5556	5379	5383	5449	5351
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	400 Mcf AF 1,300 psi/72 hrs. development Seldom Seen Colorado field	2,000 Mcf AF 1,280 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	375 Mcf AF 1,250 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	900 Mcf AF 1,280 psi/72 hrs. development County Line field	900 Mcf AF 1,320 psi/168 hrs. development County Line field	275 Mcf AF 1,440 psi/72 hrs. development Porky Run pool Ootyville field	600 Mcf AF 1,300 psi/72 hrs. development Irima pool Sanford field	200 Mcf AF 1,350 psi/72 hrs. development Irima pool Sanford field	700 Mcf AF 1,390 psi/72 hrs. development Three Bridge pool Siskirk field	800 Mcf AF 1,180 psi/528 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field

COUNTY	Permit Number	Warren 123-39827	Warren 123-39855	Warren 123-39856	Warren 123-39857	Warren 123-39858	Warren 123-39859	Warren 123-39862	Warren 123-39863	Warren 123-39864	Warren 123-39865
NAME OF WELL		Tarbell #2	Schwab Erickson #4	Cochran Knupp #1	Schwab Erickson #3	Schwab Benedict #2	Lee Oil & Gas #5	Schwab, Fisher & Young #2	Rensma Getz #3	Lloyd Brown #1	Coleman Smith #2
OPERATOR		Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Ooran & Associates, Inc. #K2-089	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Ooran & Associates, Inc. #KP-155	Doran & Associates, Inc. #KP-194
TOWNSHIP		Southwest	Southwest	Eldred	Southwest	Southwest	Eldred	Southwest	Southwest	Eldred	Southwest
QUADRANGLE		Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Spring Creek	Grand Valley
LATITUDE		8,500 ft. S 41°42'30"	6,677 ft. S 41°40'00"	14,680 ft. S 41°45'00"	5,740 ft. S 41°40'00"	9,580 ft. S 41°40'00"	4,050 ft. S 41°45'00"	13,300 ft. S 41°42'30"	12,720 ft. S 41°42'30"	13,200 ft. S 41°47'30"	3,600 ft. S 41°42'30"
LONGITUDE		3,550 ft. W 79°32'30"	8,255 ft. W 79°32'30"	4,500 ft. W 79°32'30"	10,134 ft. W 79°32'30"	11,400 ft. W 79°32'30"	1,850 ft. W 79°35'00"	7,150 ft. W 79°30'00"	6,380 ft. W 79°35'00"	4,250 ft. W 79°32'30"	7,800 ft. W 79°35'00"
DATE COMPLETED		1-9-88	11-5-87	11-10-87	10-6-87	11-2-87	10-12-87	10-6-87	12-5-87	12-2-87	6-20-88
ELEVATION		1535 GR	1490 GR	1560 GR	1580 GR	1500 GR	1662 GR	1610 GR	1500 GR	1720 GR	1550 GR
LOGS RECEIVED AND LOGGED INTERVALS							COL/GR: 3620-5455			COL/GR: 0-5493	
TULLY LIMESTONE		3760-	3806-	3717-	3886-	3785-	3658-	3907-	3670-	3694-	3642-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT		4041-	4088-	3995-	4167-	4069-	3926-	4196-	3944-	3968-	3911-
ORISKANY SANDSTONE RIDGELEY SANDSTONE		4150-	4200-		4284-	4182-		4300-	4064-		
SILURIAN-DEVONIAN CARBONATES		4176-	4227-	4119-	4305-	4201-	4066-	4322-	4088-	4044-	
SALINA GROUP LOCKPORT DOLOMITE		4297- 4903-	4356- 4990-	4236- 4842-	4436- 5052-	4338- 4964-	4126- 4882-	4456- 5072-	4212- 4856-	4154- 4922-	4122- 4693-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE		5138- 5271-	5212- 5348-	5070- 5203-	5282- 5424-	5177- 5330-	5075- 5129-	5294- 5430-	5081- 5215-	5092- 5161-	
GRIMSBY FORMATION CAROL HEAD SHALE WHIRLPOOL SANDSTONE		5317- 5558- 5494-	5307- 5531- 5577-	5247- 5598- 5425-	5474- 5611- 5650-	5379- 5520- 5558-	5176- 5312- 5342-	5480- 5616- 5654-	5261- 5208- 5376-	5206- 5208- 5376-	5179- 5349-
QUEENSTON FORMATION		5507-	5584-	5437-	5662-	5565-	5352-	5666-	5441-	5386-	5358-
PRODUCING FORMATION		Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL		5367-5504	5461-5684	5308-5433	5531-5660	5442-5564	5202-5347	5542-5662	5320-5438	5260-5382	5228-5352
TOTAL DEPTH		5646	5714	5579	5796	5704	5473	5814	5581	5539	5499
DEEPEST FORMATION REACHED		Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS		1,300 Mcf AF 1,090 psi/576 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,500 Mcf AF 1,250 psi/1056 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,100 Mcf AF 1,280 psi/1056 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,400 Mcf AF 1,310 psi/1320 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,000 Mcf AF 1,260 psi/1056 hrs. development Kirkman pool Enterprise field	879 Mcf AF 1,260 psi/72 hrs. development Three Bridge pool Selkirk field	1,000 Mcf AF 1,300 psi/1488 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	900 Mcf AF 1,250 psi/600 hrs. development Porky Run pool Ootville field	1,050 Mcf AF 1,350 psi/72 hrs. development Irlam pool Sanford field	250 Mcf AF 1,250 psi/72 hrs. development Porky Run pool Dotville field

Figure 35. (Continued).

COUNTY Permit Number	Warren 123-39874	Warren 123-39875	Warren 123-39885	Warren 123-39888	Warren 123-39897	Warren 123-39902	Warren 123-39903	Warren 123-39904	Warren 123-39905	Warren 123-39910
NAME OF WELL	Bittinger #4	Lauger #5	C. Mitchell #1	Lane Development Co. #1	Flick #1	Cochran Balaar #1	Viale #2	Benedict Eaton #1	Wright Brothers #3	Robert Walls #2
OPERATOR	U.S. Energy Development Corp.	U.S. Energy Development Corp.	Oran & Associates, Inc. #AF-159	Oran & Associates, Inc. #AF-156	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Quaker State Oil Refining Corporation	Oran & Associates, Inc. #AF-159
TOWNSHIP	Columbus	Columbus	Southwest	Eldred	Southwest	Southwest	Southwest	Southwest	Southwest	Southwest
QUADRANGLE	Columbus	Columbus	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley
LATITUDE	970 ft. S 42°00'00"	9,520 ft. S 42°00'00"	13,200 ft. S 41°42'30"	2,650 ft. S 41°45'00"	5,330 ft. S 41°40'00"	7,110 ft. S 41°40'00"	4,050 ft. S 41°40'00"	2,180 ft. S 41°42'30"	12,495 ft. S 41°42'30"	100 ft. S 41°40'00"
LONGITUDE	11,240 ft. W 79°30'00"	7,940 ft. W 79°30'00"	1,890 ft. W 79°35'00"	4,150 ft. W 79°35'00"	2,525 ft. W 79°32'30"	6,650 ft. W 79°35'00"	10,600 ft. W 79°32'30"	3,850 ft. W 79°32'30"	5,975 ft. W 79°32'30"	1,390 ft. W 79°32'30"
DATE COMPLETED	8-20-87	8-27-87	12-15-87	9-15-87	11-17-87	12-21-87	10-9-87	12-14-87	12-8-87	11-27-87
ELEVATION	1561 GR	1474 GR	1290 GR	1607 GR	1610 GR	1480 GR	1600 GR	1340 GR	1640 GR	1664 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/CNL: 518-4480 OLL: 518-4480	COL/CNL: 0-4411 OLL: 2429-4429	COL/GR: 0-5319	COL/GR: 0-3562						COL/GR: 3842-5806
TULLY LIMESTONE	2743-	2730-	3510-	3582-	3944-	3748-	3884-	3531-	3873-	3927-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3020-	3012-	3788-	3847-	4228-	4023-	4165-	3810-	4157-	4210-
ORISKANY SANDSTONE RIDGELEY SANDSTONE			3909-		4335-	4141-	4282-	3922-	4269-	4319-
SILURIAN-DEVONIAN CARBONATES	3212-	3186-	3929-	3981-	4360-	4162-	4302-	3940-	4294-	4336-
SALINA GROUP LOCKPORT DOLOMITE	3264- 3840-	3242- 3860-	4011- 4782-	4045- 4810-	4498- 5126-	4292- 4925-	4433- 5063-	4058- 4670-	4418- 5041-	4424- 5212-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4086- 4152-	4080- 4139-	4958- 5028-	5000- 5057-	5347- 5483-	5150- 5289-	5287- 5423-	4880- 5017-	5260- 5396-	5392- 5457-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	4192- 4322- 4354-	4174- 4312- 4342-	5064- 5248- 5247-	5107- 5342- 5267-	5533- 5533- 5693- 5712-	5337- 5473- 5510-	5473- 5610- 5652-	5061- 5192- 5239-	5444- 5500- 5622-	5506- 5606- 5681-
QUEENSTON FORMATION	4366-	4353-	5254-	5278-	5720-	5519-	5662-	5251-	5632-	5694-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	4459-4362	4234-4350	5125-5254	5167-5272	5574-5719	5513-5518	5531-5661	5120-5248	5484-5628	5569-5690
TOTAL DEPTH	4496	4444	5395	5405	5848	5655	5778	5375	5760	5809
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	6,500 Mcf AF 1,100 psi/72 hrs. development Osway Corners pool Columbus field	3,600 Mcf AF 1,100 psi/72 hrs. development Osway Corners pool Columbus field	1,100 Mcf AF 1,325 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	560 Mcf AF 1,325 psi/72 hrs. development Three Bridge Seikirk field	1,100 Mcf AF 1,300 psi/936 hrs. development Seldom Seen pool Colorado field	1,700 Mcf AF 1,320 psi/936 hrs. development Kiran pool Enterprise field	900 Mcf AF 1,300 psi/1488 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,000 Mcf AF 1,520 psi/360 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	900 Mcf AF 1,140 psi/120 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,100 Mcf AF 1,375 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field

COUNTY Permit Number	Warren 123-39911	Warren 123-39917	Warren 123-39920	Warren 123-39922	Warren 123-39923	Warren 123-39924	Warren 123-39925	Warren 123-39957	Warren 123-39959	Warren 123-39986
NAME OF WELL	Robert Walls #1	Huffman-Troyer Unit #2	C. Burrows #2	PennBank #1	Brudage #1	Carl W. Lindquist #1	Seigworth #4-A	Wesley Woods #4	Steffens #1	Huntington Peterson #2
OPERATOR	Doran & Associates, Inc. #KP-162	Douglas Oil & Gas, Inc.	Doran & Associates, Inc. #K2-090	Quaker State Oil Refining Corporation	Douglas Oil & Gas, Inc.	Doran & Associates, Inc. #KP-161	Doran & Associates, Inc. #KP-177	Quaker State Oil Refining Corporation	Douglas Oil & Gas, Inc.	Quaker State Oil Refining Corporation
TOWNSHIP	Southwest	Eldred	Southwest	Southwest	Spring Creek	Southwest	Southwest	Eldred	Spring Creek	Southwest
QUADRANGLE	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Spring Creek	Grand Valley	Grand Valley	Grand Valley	Spring Creek	Grand Valley
LATITUDE	520 ft. S 41°40'00"	3,500 ft. S 41°45'00"	10,975 ft. S 41°42'30"	4,100 ft. S 41°40'00"	2,750 ft. S 41°50'00"	13,150 ft. S 41°42'30"	4,550 ft. S 41°40'00"	2,100 ft. S 41°45'00"	7,800 ft. S 41°50'00"	930 ft. S 41°40'00"
LONGITUDE	3,970 ft. W 79°32'30"	3,050 ft. W 79°35'00"	7,310 ft. W 79°35'00"	10,550 ft. W 79°30'00"	600 ft. W 79°35'00"	5,100 ft. W 79°32'30"	3,650 ft. W 79°35'00"	3,000 ft. W 79°32'30"	500 ft. W 79°32'30"	3,080 ft. W 79°30'00"
DATE COMPLETED	11-24-87	11-2-87	10-21-87	11-13-87	10-29-87	10-30-87	2-3-88	11-19-87	11-4-87	1-27-88
ELEVATION	1644 GR	1642 GR	1640 GR	1555 GR	1539 GR	1685 GR	1512 GR	1585 GR	1612 GR	1550 GR
LOGS RECEIVED AND LOGGED INTERVALS	CDL/CNL/GR: 0-5788	CDL/CNL: 3600-5446	CDL/CNL/GR: 0-5661		CDL/CNL: 3194-5004 DLL: 3200-4983 PCL: 4600-4974	CDL/GR: 3880-5795	CDL/GR: 3500-5521		CDL/CNL: 3410-5181 DLL: 3410-5168 INT: 4900-5045	
TULLY LIMESTONE	3906-	3634-	3786-	3888-	3244-	3907-	3757-	3612-		3899-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4188-	3901-	4062-	4178-	3504-	4188-	4032-	3887-	3675-	4186-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4298-		4185-	4284-	3650-	4302-	4148-	4017-	3803- Bois Blanc	4287-
SILURIAN-DEVONIAN CARBONATES	4316-	4044-	4200-	4311-	3660-	4320-	4176-	4026-	3821-	4312-
SALINA GROUP LOCKPORT DOLOMITE	4403- 5192-	4104- 4854-	4278- 5042-	4405- 5050-	3708- 4448-	4410- 5212-	4256- 4972-	4120- 4736-	3892- 4610-	4452- 5051-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5360- 5438-	5040- 5109-	5246- 5316-	5290- 5423-	4622- 4666-	5360- 5437-	5225- 5296-	4952- 5086-	4800- 4857-	5290- 5427-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5488- 5640- 5665-	5152- 5280- 5322-	5364- 5506- 5534-	5474- 5621- 5654-	4690- 4844- 4877-	5486- 5621- 5663-	5342- 5482- 5482-	5130- 5275- 5305-	4878- 5042- 5070-	5478- 5607- 5648-
QUEENSTON FORMATION	5675-	5331-	5544-	5663-	4882-	5672-		5314-	5078-	5661-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5537-5670	5196-5329	5416-5541	5530-5661	4755-4881	5540-5668	5397-5522	5183-5311	4966-5073	5538-5657
TOTAL DEPTH	5833	5446	5694	5776	5004	5839	5652	5445	5185	5790
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,100 Mcf AF 1,600 psi/72 hrs. development Campbell Creek Goodwill Hill-Grand Valley field	750 Mcf AF 1,375 psi/72 hrs. development Three Bridge pool Selkirk field	766 Mcf AF 1,375 psi/72 hrs. development Forky Run pool Dotyville field	1,500 Mcf AF 1,320 psi/1488 hrs. development Selkirk pool Colorado field	1,100 Mcf AF 1,300 psi/72 hrs. development County Line field	375 Mcf AF 975 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	350 Mcf AF 1,325 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,300 Mcf AF 1,390 psi/840 hrs. development Irtam pool Sanford field	500 Mcf AF 1,350 psi/72 hrs. development Irtam pool Sanford field	1,500 Mcf AF 1,140 psi/48 hrs. development Grand Valley pool Colorado field

Figure 35. (Continued).

COUNTY Permit Number	Warren 123-3987	Warren 123-40000	Warren 123-40001	Warren 123-40022	Warren 123-40023	Warren 123-40024	Warren 123-40025	Warren 123-40026	Warren 123-40027	Warren 123-40036
NAME OF WELL	Schwab, Fisher & Young #3	Herry #3	Lane Development Co. #2	Rensma-Cobb #1	Smith #1	Trospen #1	Trospen #2	Merry-Nichols Unit #1	Nichols #3	Stone #1
OPERATOR	Quaker State Oil Refining Corporation	Oouglas Oil & Gas, Inc.	Ooran & Associates, Inc. #KP-174	Ooran & Associates, Inc. #KP-178	Quaker State Oil Refining Corporation	Oouglas Oil & Gas, Inc.	Oouglas Oil & Gas, Inc.	Oouglas Oil & Gas, Inc.	Oouglas Oil & Gas, Inc.	Oouglas Oil & Gas, Inc.
TOWNSHIP	Southwest	Spring Creek	Eldred	Spring Creek	Southwest	Spring Creek	Spring Creek	Spring Creek	Spring Creek	Spring Creek
QUADRANGLE	Grand Valley	Spring Creek	Grand Valley	Spring Creek	Grand Valley	Spring Creek	Spring Creek	Spring Creek	Spring Creek	Spring Creek
LATITUDE	880 ft. S 41°40'00"	5,500 ft. S 41°50'00"	1,530 ft. S 41°45'00"	10,276 ft. S 41°50'00"	6,975 ft. S 41°42'30"	9,400 ft. S 41°50'00"	8,200 ft. S 41°50'00"	11,600 ft. S 41°50'00"	9,800 ft. S 41°50'00"	9,850 ft. S 41°50'00"
LONGITUDE	5,680 ft. W 79°30'00"	3,300 ft. W 79°32'30"	2,700 ft. W 79°35'00"	9,850 ft. W 79°32'30"	6,200 ft. W 79°32'30"	1,750 ft. W 79°35'00"	2,750 ft. W 79°35'00"	6,250 ft. W 79°35'00"	6,200 ft. W 79°35'00"	3,750 ft. W 79°35'00"
DATE COMPLETED	12-28-87	2-9-88	1-30-88	1-14-88	1-13-87	3-5-88	2-26-88	2-22-88	2-1-88	1-29-88
ELEVATION	1530 GR	1662 GR	1714 GR	1586 GR	1565 GR	1531 GR	1523 GR	1582 GR	1574 GR	1552 GR
LOGS RECEIVED AND LOGGED INTERVALS		COL/CNL: 3400-5221	COL/CNL/GR: 0-5472			COL/CNL: 3200-5071	COL/CNL: 3233-5036	PCL: 4650-5043	COL/CNL: 3230-5078	COL/CNL: 3250-5094
TULLY LIMESTONE	3858-	3442-	3682-	3340-	3759-	3287-	3264-	3330-	3308-	3297-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4145-	3706-	3948-	3607-	4038-	3548-	3525-	3587-	3566-	3556-
ORISKANY SANDSTONE RIDGELY SANDSTONE	4248-	3826- Bois Blanc			4151-	3670- Bois Blanc	3650- Bois Blanc	3712- Bois Blanc	3700- Bois Blanc	3691- Bois Blanc
SILURIAN-DEVONIAN CARBONATES	4273-	3846-	4088-		4172-	3692-	3670-	3729-	3718-	3712-
SALINA GROUP LOCKPORT DOLOMITE	4414- 5020-	3905- 4541-	4156- 4888-		4297- 4903-	3762- 4402-	3730- 4380-	3789- 4395-	3788- 4474-	3788- 4422-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5245- 5378-	4816- 4881-	5081- 5153-		5124- 5257-	4678- 4742-	4650- 4716-	4682- 4780-	4728- 4757-	4690- 4753-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	5427- 5573- 5605-	4927- 5067- 5094-	5200- 5328- 5364-		5305- 5434- 5478-	4784- 4922- 4952-	4746- 4896- 4924-	4830- 4952- 4989-	4780- 4935- 4964-	4800- 4930- 4963-
QUEENSTON FORMATION	5616-	5104-	5376-		5490-	4962-	4930-	4999-	4972-	4970-
PRODUCING FORMATION	Medina	Medina	Medina	Dnondaga	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5490-5613	4977-5101	5298-5370	3607-3685	5361-5485	4832-4958	4824-4927	4859-4994	4849-4970	4842-4967
TOTAL DEPTH	5752	5221	5516	3685	5654	5076	5040	5090	5082	5094
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Dnondaga	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,400 Mcf AF 1,075 psi/48 hrs. development Seldom Seen pool Colorado field	600 Mcf AF 1,290 psi/48 hrs development County Line field	300 Mcf AF 1,320 psi/72 hrs. development Three Bridge pool Selkirk field	Oil producer IP not reported Shallow pool test Cobb Corners pool County Line field	1,000 Mcf AF 980 psi/48 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,000 Mcf AF 1,325 psi/48 hrs. development County Line field	650 Mcf AF 1,300 psi/48 hrs. development County Line field	1,000 Mcf AF 1,325 psi/48 hrs. development County Line field	600 Mcf AF 1,275 psi/48 hrs. development County Line field	1,200 Mcf AF 1,240 psi/48 hrs. development County Line field

COUNTY Permit Number	Warren 123-40043	Warren 123-40044	Warren 123-40045	Warren 123-40046	Warren 123-40047	Warren 123-40048	Warren 123-40049	Warren 123-40050	Warren 123-40051	Warren 123-40052
NAME OF WELL	Kibbey #2	Kibbey #3	Shank Heirs #6	Shank Heirs #1	Shank Heirs #5	R.C.Litzinger #1	Lowell J. Weidner #2	William Daelhausen #2	Norman L. Kibbey #1	Boyd R. Bush #4
OPERATOR	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.
TOWNSHIP	Eldred	Eldred	Southwest	Southwest	Southwest	Eldred	Southwest	Southwest	Eldred	Eldred
QUADRANGLE	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley
LATITUDE	13,600 ft. S 41°45'00"	12,950 ft. S 41°45'00"	12,300 ft. S 41°40'00"	9,400 ft. S 41°40'00"	10,900 ft. S 41°40'00"	6,500 ft. S 41°45'00"	6,000 ft. S 41°40'00"	12,000 ft. S 41°40'00"	12,800 ft. S 41°45'00"	14,400 ft. S 41°45'00"
LONGITUDE	10,750 ft. W 79°30'00"	12,000 ft. W 79°30'00"	2,350 ft. W 79°35'00"	3,150 ft. W 79°35'00"	3,150 ft. W 79°35'00"	5,010 ft. W 79°30'00"	7,100 ft. W 79°32'30"	8,200 ft. W 79°32'30"	9,400 ft. W 79°30'00"	4,250 ft. W 79°35'00"
DATE COMPLETED	2-9-88	7-11-88	3-8-88	2-17-88	3-3-88	2-26-88	3-4-88	2-12-88	2-9-88	3-21-88
ELEVATION	1410 GR	1363 GR	1250 GR	1565 GR	1500 GR	1680 GR	1585 GR	1500 GR	1440 GR	1655 GR
LOGS RECEIVED AND LOGGED INTERVALS										
TULLY LIMESTONE	3582-	3512-	3577-	3878-	3812-	3781-	3901-	3848-	3605-	3734-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3867-	3793-	3854-	4158-	4090-	4071-	4194-	4134-	3892-	4006-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	3965- Bois Blanc	3887- Bois Blanc	3971-	4282-	4208-	4167- Bois Blanc	4300-	4244-	3988- Bois Blanc	4097- Bois Blanc
SILURIAN-DEVONIAN CARBONATES	3994-	3913-	3996-	4309-	4231-	4191-	4318-	4265-	4014-	4140-
SALINA GROUP LOCKPORT DOLOMITE	4109- 4714-	4032- 4645-	4129- 4786-	4423- 5048-	4362- 4997-	4300- 4911-	4452- 5081-	4404- 5050-	4129- 4712-	4253- 4872-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4934- 5064-	4862- 4995-	5002- 5138-	5284- 5426-	5220- 5360-	5131- 5262-	5306- 5441-	5270- 5412-	4946- 5081-	5087- 5224-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5112- 5252- 5286-	5039- 5178- 5216-	5190- 5322- 5366-	5474- 5610- 5652-	5412- 5548- 5588-	5309- 5447- 5478-	5400- 5627- 5667-	5465- 5591- 5638-	5126- 5270- 5303-	5267- 5391- 5437-
QUEENSTON FORMATION	5300-	5227-	5372-	5660-	5594-	5489-	5677-	5648-	5312-	5450-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5167-5295	5093-5224	5253-5371	5541-5658	5469-5594	5366-5485	5544-5675	5520-5647	5167-5295	5315-5445
TOTAL DEPTH	5420	5357	5514	5790	5739	5624	5813	5777	5429	5576
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,200 Mcf AF 1,180 psi/48 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,500 Mcf AF 1,260 psi/312 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	2,000 Mcf AF 1,180 psi/96 hrs. development Campbell Creek pool Enterprise field	1,500 Mcf AF 1,160 psi/48 hrs. development Campbell Creek pool Enterprise field	1,700 Mcf AF 1,140 psi/96 hrs. development Campbell Creek pool Enterprise field	1,900 Mcf AF 1,040 psi/168 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,900 Mcf AF 1,190 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,900 Mcf AF 1,160 psi/96 hrs. development Campbell Creek pool Enterprise field	1,200 Mcf AF 1,180 psi/48 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,000 Mcf AF 1,000 psi/144 hrs development Three Bridge Selkirk field

Figure 35. (Continued).

COUNTY Permit Number	Warren 123-40055	Warren 123-40064	Warren 123-40071	Warren 123-40077	Warren 123-40078	Warren 123-40080	Warren 123-40085	Warren 123-40086	Warren 123-40088	Warren 123-40089
NAME OF WELL	Boyd R. Bush #3	Raymond L. Kinnear #1	Lowell J. Weidner #3	Mickey Payne #1	Mickey Payne #2	Clark #1	R. & B. Miller #2	Kightlinger #1-C	G. Flowers #1	B. Streeter #1
OPERATOR	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	Douglas Oil & Gas, Inc.	M.A.T. Oil & Gas Exploration, Inc.	Doran & Associates, Inc. #RP-183	Douglas Oil & Gas, Inc.	Eastern States Energy, Inc.
TOWNSHIP	Eldred	Southwest	Southwest	Eldred	Eldred	Spring Creek	Southwest	Eldred	Spring Creek	Columbus
QUADRANGLE	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Spring Creek	Grand Valley	Grand Valley	Spring Creek	Columbus
LATITUDE	14,550 ft. S 41°45'00"	7,450 ft. S 41°40'00"	9,100 ft. S 41°40'00"	4,400 ft. S 41°45'00"	3,450 ft. S 41°45'00"	12,100 ft. S 41°50'00"	4,650 ft. S 41°42'30"	4,330 ft. S 41°45'00"	450 ft. S 41°50'00"	1,950 ft. S 41°55'00"
LONGITUDE	2,750 ft. W 79°35'00"	11,950 ft. W 79°32'30"	6,050 ft. W 79°32'30"	6,150 ft. W 79°30'00"	5,050 ft. W 79°30'00"	10,900 ft. W 79°32'30"	6,650 ft. W 79°30'00"	5,130 ft. W 79°37'30"	5,200 ft. W 79°35'00"	10,250 ft. W 79°30'00"
DATE COMPLETED	3-17-88	3-15-88	2-24-88	2-3-88	3-10-88	3-11-88	3-11-88	2-25-88	2-10-88	3-18-88
ELEVATION	1710 GR	1510 GR	1540 GR	1365 GR	1381 GR	1564 GR	1585 GR	1511 GR	1760 GR	1805 GR
LOGS RECEIVED AND LOGGED INTERVALS						CDL/CNL: 3300-5139			CDL/CNL: 3400-5237	
TULLY LIMESTONE	3793-	3827-	3880-	3456-	3446-	3351-	3807-	3542-	3454-	3244-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4066-	4106-	4164-	3746-	3736-	3614-	4096-	3816-	3710-	3533-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4172- Bois Blanc	4222-	4273-	3843- Bois Blanc	3834- Bois Blanc	3742- Bois Blanc	4197-	3916-		3681-
SILURIAN-DEVONIAN CARBONATES	4201-	4247-	4292-	3864-	3858-	3758-	4216-		3860-	3692-
SALINA GROUP LOCKPORT DOLOMITE	4316- 4932-	4375- 5003-	4432- 5076-	3972- 4584-	3964- 4777-	3824- 4468-	4306- 4954-	4010-	3918- 4570-	3763- 4341-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5148- 5286-	5244- 5363-	5295- 5434-	4798- 4934-	4798- 4929-	4748- 4806-	5176- 5307-	4794-	4844- 4894-	4630- 4673-
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	5334- 5458- 5500-	5413- 5550- 5591-	5486- 5633- 5662-	4976- 5127- 5153-	4974- 5112- 5148-	4850- 4976- 5015-	5353- 5498- 5529-	5014- 5225-	4940- 4834- 5102-	4710- 4834- 4882-
QUEENSTON FORMATION	5512-	5600-	5670-	5164-	5160-	5024-	5540-	5245-	5114-	4893-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5378-5508	5476-5598	5538-5668	5031-5160	5026-5157	4892-5020	5420-5536	5110-5236	4986-5111	4770-4892
TOTAL DEPTH	5637	5733	5801	5298	5289	5142	5669	5406	5237	4997
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,400 Mcf AF 1,090 psi/21 hrs. development Three Bridge pool Selkirk field	1,500 Mcf AF 1,240 psi/96 hrs. development Kiran pool Enterprise field	2,000 Mcf AF 1,185 psi/96 hrs. development Seldom Seen pool Colorado field	1,000 Mcf AF 1,300 psi/ 6 hrs. development Trim pool Sanford field	1,600 Mcf AF 1,225 psi/23 hrs. development Trim pool Sanford field	600 Mcf AF 1,400 psi/48 hrs. development County Line field	1,800 Mcf AF 1,100 psi/96 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	350 Mcf AF 1,300 psi/72 hrs. development Trim pool Sanford field	600 Mcf AF 1,275 psi/48 hrs. development West Spring Creek pool Spring Creek field	IP not reported 1,100 psi/72 hrs. development Whites Run pool Columbus field

COUNTY Permit Number	Warren 123-40090	Warren 123-40091	Warren 123-40094	Warren 123-40096	Warren 123-40097	Warren 123-40099	Warren 123-40100	Warren 123-40103	Warren 123-40105	Warren 123-40111
NAME OF WELL	Robert Wallis #3	Rybacki #1	Clark #1	R. Reed #1	John W. Wood #1	Krupa-Merry Unit #1	Olinger #1	A.C. Grischaw Unit #1	Robert Miller #1	A. Absher Unit #1
OPERATOR	Doran & Associates, Inc. #KP-184	Douglas Oil & Gas, Inc.	Doran & Associates, Inc. #KP-180	Doran & Associates, Inc. #KP-213	Doran & Associates, Inc. #KP-182	Douglas Oil & Gas, Inc.	Doran & Associates, Inc. #KP-181	Doran & Associates, Inc. #KP-195	Doran & Associates, Inc. #KP-179	Doran & Associates, Inc. #KP-193
TOWNSHIP	Southwest	Spring Creek	Southwest	Eldred	Spring Creek	Spring Creek	Spring Creek	Eldred	Southwest	Eldred
QUADRANGLE	Grand Valley	Spring Creek	Grand Valley	Spring Creek	Spring Creek	Spring Creek	Grand Valley	Grand Valley	Grand Valley	Spring Creek
LATITUDE	1,400 ft. S 41°40'00"	4,000 ft. S 41°50'00"	6,780 ft. S 41°40'00"	7,700 ft. S 41°47'30"	2,780 ft. S 41°50'00"	3,350 ft. S 41°50'00"	5,610 ft. S 41°40'00"	200 ft. S 41°45'00"	13,460 ft. S 41°42'30"	14,880 ft. S 41°47'30"
LONGITUDE	2,480 ft. W 79°32'30"	4,050 ft. W 79°35'00"	2,150 ft. W 79°35'00"	1,700 ft. W 79°35'00"	2,100 ft. W 79°35'00"	8,850 ft. W 79°32'30"	780 ft. W 79°35'00"	910 ft. W 79°35'00"	7,440 ft. W 79°32'30"	2,960 ft. W 79°35'00"
DATE COMPLETED	2-10-88	2-29-88	2-22-88	9-12-88	3-7-88	2-24-88	2-16-88	4-12-88	3-1-88	4-11-88
ELEVATION	1615 GR	1552 GR	1588 GR	1703 GR	1508 GR	1621 GR	1564 GR	1653 GR	1581 GR	1630 GR
LOGS RECEIVED AND LOGGED INTERVALS	COL/GR: 3862-5833	COL/CNL: 3200-5009			COL/CNL/GR: 50-4910	COL/CNL: 3300-5105	COL/CNL: 3800-5748	COL/CNL: 3600-5468	COL/CNL: 3700-5704	COL/CNL: 3596-5410
TULLY LIMESTONE	3893-	3256-	3885-	3570-	3206-	3354-	3832-	3621-	3804-	3614-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	4214-	3512-	4169-	3840-	3463-	3612-	4114-	3888-	4086-	3874-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4282-	3640- Bois Blanc				3736- Bois Blanc	4230-		4196-	
SILURIAN-DEVONIAN CARBONATES	4304-	3660-	4315-		3608-	3754-	4246-	4022-	4210-	4016-
SALINA GROUP LOCKPORT DOLOMITE	4385- 5180-	3720- 4362-	4465- 4989-	4035- 4525-	3672- 4304-	3814- 4440-	4328- 5024-	4089- 4760-	4295- 4990-	4080- 4830-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	5346- 5426-	4626- 4695-	5332-	4965-	4564- 4630-	4712- 4763-	5300- 5365-	5014- 5092-	5262- 5338-	5004- 5074-
GRIMSBY FORMATION CAROL HEAD SHALE WHITPOOL SANDSTONE	5474- 5632- 5654-	4736- 4874- 4904-	5460-	5071-	4678- 4810- 4839-	4804- 4942- 4973-	5396- 5562- 5596-	5140- 5272- 5306-	5384- 5528- 5566-	5116- 5252- 5288-
QUEENSTON FORMATION	5664-	4911-	5665-	5252-	4848-	4982-	5602-	5315-	5573-	5296-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5544-5659	4797-4909	5550-5662	5107-5260	4722-4842	4850-4978	5488-5601	5185-5310	5447-5499	5140-5293
TOTAL DEPTH	5845	5009	5818	5394	5016	5115	5748	5459	5711	5432
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	450 Mcf AF 1,300 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,300 Mcf AF 1,340 psi/48 hrs. development West Spring Creek pool Spring Creek field	350 Mcf AF 1,250 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	664 Mcf AF 1,190 psi/72 hrs. development County Line field	375 Mcf AF 1,000 psi/72 hrs. extension West Spring Creek pool Spring Creek field	800 Mcf AF 1,340 psi/48 hrs. development County Line field	375 Mcf AF 1,325 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	300 Mcf AF 1,280 psi/72 hrs. development Three Bridge pool Selkirk field	400 Mcf AF 1,275 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	275 Mcf AF 1,275 psi/72 hrs. development Three Bridge pool Selkirk field

Figure 35. (Continued).

COUNTY Permit Number	Warren 123-40115	Warren 123-40116	Warren 123-40130	Warren 123-40138	Warren 123-40184	Warren 123-40198	Warren 123-40224	Warren 123-40225	Warren 123-40269	Warren 123-40277
NAME OF WELL	Lyle Miles #1	Lyle Miles #2	Meivin E. Gray #1	O. Carter Jr. Unit #1	L. Brown #1	Pennzoil #1	S. Rensma #1	Graham #1	Robert Oallas #1	P. Baker #2
OPERATOR	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	Doran & Associates, Inc. #RP-197	U.S. Energy Development Corp.	M.A.T. Oil & Gas Exploration, Inc.	Doran & Associates, Inc. #RP-198	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	M.A.T. Oil & Gas Exploration, Inc.	Doran & Associates, Inc. #RP-210
TOWNSHIP	Eldred	Eldred	Southwest	Columbus	Eldred	Southwest	Eldred	Eldred	Southwest	Spring Creek
QUADRANGLE	Grand Valley	Grand Valley	Grand Valley	Columbus	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Spring Creek
LATITUDE	7 100 ft. S 41°45'00"	7 400 ft. S 41°45'00"	5 590 ft. S 41°42'30"	6 950 ft. S 42°00'00"	200 ft. S 41°45'00"	1 510 ft. S 41°42'30"	7 225 ft. S 41°45'00"	8 350 ft. S 41°45'00"	8 700 ft. S 41°40'00"	11 650 ft. S 41°52'30"
LONGITUDE	2 850 ft. W 79°35'00"	4 400 ft. W 79°35'00"	3 370 ft. W 79°35'00"	4 290 ft. W 79°30'00"	200 ft. W 79°30'00"	7 210 ft. W 79°35'00"	4 550 ft. W 79°32'30"	2 450 ft. W 79°32'30"	1 300 ft. W 79°35'00"	6 500 ft. W 79°35'00"
DATE COMPLETED	11-19-88	6-14-88	3-22-88	8-18-88	6-30-88	6-27-88	7-5-88	6-28-88	7-17-88	8-22-88
ELEVATION	1625 GR	1520 GR	1195 GR	1540 GR	1380 GR	1674 GR	1630 GR	1530 GR	1515 GR	1880 GR
LOGS RECEIVED AND LOGGED INTERVALS			COL/GR: 0-5532	COL/CML: 0-4522 DLC: 0-4522 CBL/CML: 2089-4495 INT: 0-4522		COL: 882-5571				
TULLY LIMESTONE	3659-	3551-	3692-	2793-	3454-	3748-	3701-	3621-	3814-	3526-
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3929-	3821-	3966-	3080-	3744-	4022-	3975-	3900-	4098-	3782-
ORISKANY SANDSTONE RIDGELEY SANDSTONE	4026- Bois Blanc	3918- Bois Blanc	4095-		3840- Bois Blanc		4074- Bois Blanc	4000- Bois Blanc	4217-	
SILURIAN-DEVONIAN CARBONATES	4068-	3962-	4108-	3252-	3860-	4058-	4106-	4025-	4244-	
SALINA GROUP LOCKPORT DOLOMITE	4175- 4783-	4070- 4680-	4176- 4868-	3312- 3984-	3970- 4599-	4242- 4890-	4200- 4839-	4134- 4758-	4364- 4997-	3991- 4528-
ROCHESTER SHALE IRONDEQUOIT DOLOMITE	4998- 5132-	4888- 5024-	5136- 5205-	4150- 4213-	4814- 4950-	5178- 5246-	5050- 5185-	4974- 5105-	5221- 5360-	4768- 4851-
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE	5181- 5309- 5346-	5067- 5210- 5238-	5237- 5378- 5420-	4249- 4363- 4415-	4996- 5121- 5166-	5300- 5434- 5460-	5230- 5357- 5403-	5149- 5295- 5326-	5411- 5549- 5586-	4986- 5142-
QUEENSTON FORMATION	5358-	5250-	5431-	4427-	5179-	5470-	5415-	5338-	5594-	5164-
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina
PRODUCING INTERVAL	5229-5354	5120-5244	5329-5427	4314-4421	5070-5175	5363-5468	5285-5413	5211-5333	5471-5594	5023-5140
TOTAL DEPTH	5498	5367	5418	4527	5312	5619	5551	5463	5718	5323
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston
RESULTS	1,000 Mcf AF 1,260 psi/72 hrs. development Three Bridge pool Seikirk field	1,500 Mcf AF 1,260 psi/72 hrs. development Three Bridge pool Seikirk field	375 Mcf AF 1,275 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,000 Mcf AF 1,200 psi/72 hrs. development Owey Carriers pool Columbus field	1,200 Mcf AF 1,270 psi/48 hrs. development Irisham pool Sanford field	270 Mcf AF 1,260 psi/72 hrs. development Forky Run pool Dorville field	1,400 Mcf AF 1,230 psi/54 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,800 Mcf AF 1,175 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	1,600 Mcf AF 1,145 psi/144 hrs. development Kirkman pool Enterprise field	685 Mcf AF 1,340 psi/72 hrs. development West Spring Creek pool Spring Creek field

COUNTY Permit Number	Warren 123-40278	Warren 123-40279	Warren 123-40281	Warren 123-40282	Warren 123-40304	Warren 123-40315	Warren 123-40316	Warren 123-40327	Warren 123-40331	Westmoreland 129-23042
NAME OF WELL	A. Wright #3	G. Wolosen #1	Rensma-Cobb #2	Lee Oil & Gas #12	Pennzoil #2-A	Pennzoil #4-A	Pennzoil #3-A	John W. Wood Unit #2	F. Kuas #1	Mellon Bank N.A. #1
OPERATOR	Ooran & Associates, Inc. #RP-203	Ooran & Associates, Inc. #RP-202	Ooran & Associates, Inc. #RP-212	Ooran & Associates, Inc. #RP-92	Ooran & Associates, Inc. #RP-204	Ooran & Associates, Inc. #RP-200	Ooran & Associates, Inc. #RP-205	Ooran & Associates, Inc. #RP-201	Ooran & Associates, Inc. #RP-211	CNG Development Company, #2842
TOWNSHIP	Spring Creek	Spring Creek	Spring Creek	Eldred	Eldred	Eldred	Eldred	Spring Creek	Spring Creek	Ligonier
QUADRANGLE	Spring Creek	Spring Creek	Spring Creek	Grand Valley	Grand Valley	Grand Valley	Grand Valley	Spring Creek	Spring Creek	Ligonier
LATITUDE	13,520 ft. S 41°52'30"	15,100 ft. S 41°52'30"	10,320 ft. S 41°50'00"	8,340 ft. S 41°45'00"	8,960 ft. S 41°45'00"	10,475 ft. S 41°45'00"	10,475 ft. S 41°45'00"	2,100 ft. S 41°50'00"	4,690 ft. S 41°50'00"	15,000 ft. S 40°15'00"
LONGITUDE	1,380 ft. W 79°35'00"	2,400 ft. W 79°35'00"	8,025 ft. W 79°32'30"	6,025 ft. W 79°32'30"	4,300 ft. W 79°32'30"	5,200 ft. W 79°32'30"	3,300 ft. W 79°32'30"	4,290 ft. W 79°35'00"	280 ft. W 79°35'00"	3,175 ft. W 79°07'30"
DATE COMPLETED	8-9-88	7-30-88	9-2-88	7-25-88	7-18-88	7-1-88	7-13-88	7-11-88	8-29-88	11-20-87
ELEVATION	1583 GR	1629 GR	1625 GR	1445 GR	1627 GR	1570 GR	1707 GR	1588 GR	1570 GR	2755 GR
LOGS RECEIVED AND LOGGED INTERVALS					COL/CNL/GR: 0-5529	COL/GR: 0-5472	COL: 3750-5616	COL: 3200-4956 DLL: 3200-4973		
TULLY LIMESTONE	3259-	3299-	3427-	3508-	3704-	3644-	3790-	3269-	3297-	
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	3524-	3557-	3690-	3778-	3981-	3920-	4068-	3522-	3552-	7588-
ORISKANY SANDSTONE RIOGEELEY SANDSTONE	3635-	3706-	3812-	3883-					3732-	7714-
SILURIAN-DEVONIAN CARBONATES				3898-	4100-	4046-	4172-	3666-		7787-
SALINA GROUP LOCKPORT DOLOMITE	4241-	3770- 4302-	3881- 4459-	3948- 4565-	4168- 4860-	4114- 4778-	4205- 4934-	3730- 4366-	3760- 4377-	
ROCHESTER SHALE IRONDEQUOIT DOLOMITE				4846-	5120- 5188-	5058- 5124-	5206- 5270-	4644- 4706-	4453-	
GRIMSBY FORMATION CAROT HEAD SHALE WHIRLPOOL SANDSTONE	4703- 4889-	4825-	4947- 5020- 5090-	5022- 5200-	5232- 5372- 5408-	5172- 5318- 5344-	5314- 5470- 5491-	4759- 4884- 4912-	4760- 4890- 4923-	
QUEENSTON FORMATION	4906-	4945-	5097-	5252-	5418-	5357-	5504-	4924-	4932-	
PRODUCING FORMATION	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Medina	Huntersville Ridgely
PRODUCING INTERVAL	4752-4874	4804-4927	4943-5096	5087-5206	5296-5416	5236-5353	5375-5598	4796-4915	4772-4928	7582-77.
TOTAL DEPTH	5078	5108	5242	5347	5577	5503	5640	5054	5108	7942
DEEPEST FORMATION REACHED	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Queenston	Helderberg
RESULTS	375 Mcf AF 1,250 psi/72 hrs. development West Spring Creek pool Spring Creek field	698 Mcf AF 1,420 psi/72 hrs. development West Spring Creek pool Spring Creek field	838 Mcf AF 1,355 psi/72 hrs. development County Line field	617 Mcf AF 1,295 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	275 Mcf AF 1,325 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	320 Mcf AF 1,365 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	365 Mcf AF 1,350 psi/72 hrs. development Campbell Creek pool Goodwill Hill-Grand Valley field	325 Mcf AF 1,375 psi/72 hrs. development West Spring Creek pool Spring Creek field	1,014 Mcf AF 1,365 psi/72 hrs. development County Line field	6,100 Mcf AF 2,400 psi/72 hrs. development New pool wildcat field Johnstown field

Figure 35. (Continued).

COUNTY Permit Number	Westmoreland 129-23061	Westmoreland 129-23075	Westmoreland 129-23134	Westmoreland 129-23135					
NAME OF WELL	Mellon Bank N.A. #2	Kalp Unit #1	Commonwealth of Pa, Tract #353	J. Taggart #1					
OPERATOR	CNG Development Company, #2844	Somerset Exploration Corporation	CNG Development Company, #3396	CNG Development Company, #3246					
TOWNSHIP	Ligonier	Donegal	Cook	Ligonier					
QUADRANGLE	Ligonier	Seven Springs	Ligonier	Ligonier					
LATITUDE	3,750 ft. S 40°10'00"	13,000 ft. S 40°07'30"	13,300 ft. S 40°10'00"	10,020 ft. S 40°15'00"					
LONGITUDE	11,200 ft. W 79°10'00"	1,480 ft. W 79°17'30"	4,450 ft. W 79°10'00"	400 ft. W 79°07'30"					
DATE COMPLETED	12-22-87	1-22-88	9-15-88	9-16-88					
ELEVATION	2316 GR	2390 GR	2705 GR	2180 GR					
LOGS RECEIVED AND LOGGED INTERVALS									
TULLY LIMESTONE			7412-	6477-					
ONONDAGA LIMESTONE HUNTERSVILLE CHERT	7808-	7468-	8024- 8050-	7169- 7183-					
ORISKANY SANDSTONE RIDGELEY SANDSTONE	7970-	7632-	8316-	7280-					
SILURIAN-DEVONIAN CARBONATES	8040-	7740-	8396-	7408-					
SALINA GROUP LOCKPORT DOLOMITE									
ROCHESTER SHALE IRONDEQUOIT DOLOMITE									
GRIMSBY FORMATION CABOT HEAD SHALE WHIRLPOOL SANDSTONE									
QUEENSTON FORMATION									
PRODUCING FORMATION	Huntersville Ridgeley		Huntersville Ridgeley	Huntersville Ridgeley					
PRODUCING INTERVAL	7880-8028		8168-8316	7190-7352					
TOTAL DEPTH	8181	7880	8595	7553					
DEEPEST FORMATION REACHED	Huntersville Ridgeley	Helderberg	Helderberg	Helderberg					
RESULTS	2,100 Mcf AF 2,820 psi/18 hrs. development Linn Run field	Plugged and abandoned field wildcat	2,654 Mcf AF 2,124 psi/38 hrs. development Silver Mine pool Linn Run field	3,974 Mcf AF 1,906 psi/72 development Silver Mine pool Linn Run field					

